

# CHAPTER 8

## DRAINAGE AND DRAINAGE SYSTEMS

### TABLE OF CONTENTS

8.1	General Considerations.....	8-1
8.2	Surface Water Drainage.....	8-1
8.3	Authorization to Enter Private Property for Drainage Activities	8-2
8.4	Driveways and Drainage Problems .....	8-5
8.5	Drainage Maintenance Responsibilities Concerning Municipalities .....	8-5
8.6	Pipes, Culverts, Inlets, Endwalls.....	8-10
8.7	Pipe Replacement.....	8-11
8.8	Subsurface Water Drainage .....	8-14
8.9	Erosion and Sedimentation Control .....	8-15
8.10	Illicit Discharge Detection and Elimination .....	8-17
8.11	Stormwater Control Measures .....	8-18
	Exhibits.....	8-20

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**ACRONYMS**

BFM – Bureau of Fiscal Management  
BMP – Best Management Practice  
BOMO – Bureau of Maintenance and Operations  
CCD – County Conservation District  
DE – District Executive  
DEP – Department of Environmental Protection  
DO – District Office  
DOFO – District Office Fiscal Officer  
E&S – Erosion and Sediment  
GP – General Permit  
HOP – Highway Occupancy Permit  
IDD – Illicit Discharge Detention  
IDDE – Illicit Discharge Detention and Elimination  
IDRF – Illicit Discharge Reporting Form  
KEeS - Keystone Environmental ePermitting System  
MS4 – Municipal Separate Storm Sewer System  
MTLD – Maintenance Technical Leadership Division  
NPDES – National Pollutant Discharge Elimination System  
OAG – Office of the Attorney General  
PADEP – Pennsylvania Department of Environmental Protection  
PennDOT – Pennsylvania Department of Transportation  
PID – Potential Illicit Discharges  
RMA – Road Maintenance Activity  
SCM – Stormwater Control Measure  
TAC – Pennsylvania State Transportation Advisory Committee  
TIP – Transportation Improvement Program  
UA – Urbanized Area  
WBS – Work Breakdown Structure

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## 8.1 GENERAL CONSIDERATIONS

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Drainage is an essential element to be considered in the maintenance of a highway system. The purpose of a highway drainage system is to convey water away from the road as quickly as possible to prevent erosion of the roadway and saturation of the subgrade, and to prevent standing water or ice on the roadway surface. An efficient highway drainage system provides for the disposal of surface water from the roadway section and the elimination or control of subsurface water.

Included in a surface drainage system are the roadway crown, shoulder, curbs, gutters, drop inlets, storm drains, ditches/swales and pipes/culverts. A surface drainage system is provided to permit water to flow from the roadway surface as rapidly as possible and away from the highway.

Subsurface drainage systems include pipe underdrains, pavement base drains and combination storm sewer and underdrain. Examples of these are shown on [Publication 72M, Standard Drawing RC-30M](#). The objective of a subsurface drainage system is to convey away any water that gets into base material. Subsurface drainage is a practical and economical way of maintaining firm, stable subgrades and structure foundations, eliminating saturated ground and preventing or reducing frost heave.

All drainage facilities should be maintained in operating condition to work as designed, with special attention given to fall cleaning so that structures will be ready to handle spring and summer rains. This requires year-round maintenance with emphasis on side ditch cleaning in the fall and early cleanup in the spring.

Properly cut shoulders allow water to drain away from the road surface and to flow to the nearest inlet or swale. Side dozing operations (removal of accumulated material from beneath guiderail) on unpaved shoulders and side approaches provides efficient drainage. [Publication 23, Chapter 5](#) contains additional information concerning shoulders.

Routine maintenance of drainage systems should consist of periodic inspections, including pre- and post-storm inspections, and drainage cleaning activities. Regular inspections should be conducted to confirm that satisfactory conditions exist and to evaluate needs for cleanup and repair.

Marked settling of an area or part of a roadway (usually with pavement breakups or cracks) during or following the wet season is generally an indication that a drainage problem may exist.

In summary, maintenance of highway drainage systems is key to preserving the structural integrity of pavement, minimizing safety hazards, and avoiding costly repairs.

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## 8.2 SURFACE WATER DRAINAGE

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Two types of water courses that handle surface drainage are natural water courses and manmade water courses. A natural watercourse is a natural channel where water flows between banks that are more or less defined. The flow of water does not need to be constant, but the channel must be a permanent landmark. An important part of drainage maintenance for culverts carrying natural watercourses is the cleaning of obstructions such as trees, branches, boulders and sandbars.

Ditches and swales are manmade conveyances that are generally classified as parallel ditches, diversion ditches and inlet or outlet ditches. Parallel ditches are channels that are constructed parallel to the roadway for the purpose of carrying runoff coming from the pavement, shoulders and adjacent areas. They are usually open unless crossing under side roads, driveway or walkways. Parallel ditches are often grass-lined, but may be lined with riprap where vegetative growth is inhibited (e.g., under bridges) or paving material in mountainous terrain to minimize erosion.

Diversion ditches are constructed parallel to the top of a cut slope and are intended to intercept surface drainage from flowing over the face of the slope, thus preventing erosion and slides. They may also be vegetated, rock-lined, or paved.

Inlet and outlet ditches serve primarily to carry water to and from cross pipes. They are generally perpendicular or slightly skewed to the centerline of the road, and often extend from or onto private property. PennDOT's responsibility to maintain these ditches extends only as far as necessary to achieve free flow of

drainage to and from the cross pipe, while avoiding excessive volume or velocity of water discharged onto private property. In some cases, it may be necessary for PennDOT to perform work outside of the right-of-way. Section 8.3 describes this procedure.

Periodic inspections should be made, especially after heavy rains and in the spring after snow and ice melt. The inspection should include but not necessarily be limited to:

1. Checking ditch line for uniformity and obstructions.
2. Checking side slopes for erosion and possible need for protection of erosion.
3. Checking condition of ditch paving materials.
4. Checking sediment deposits, weeds and brush growth in ditch line.

Ditches, swales and drainage channels should be maintained to the line, grade, depth and cross section to which they were constructed or subsequently improved. Vegetated channels should be mowed to prevent the establishment of woody plants and they should be kept reasonably clear of obstructing materials which may restrict the normal flow of water. Paved ditches should be maintained in a condition to ensure a smooth and impervious surface to prevent underflow of water. Cracks and joints in asphalt or concrete paved ditches and paved gutters should be repaired as necessary and the joints sealed.

Care must be taken in identifying which features are ordinary drainage channels and which are Stormwater Control Measures (SCMs). SCMs must be maintained in accordance with [Publication 888](#), Stormwater Control Measure Maintenance Manual. Maintenance-IQ contains the Department's inventory of SCMs. Each county should become familiar with the locations of all SCMs in their jurisdiction. [Publication 888](#) includes specifications for SCM identification markers. Districts and counties are encouraged to install markers to help avoid unintentional damage to SCMs.

All ditches, swales and drainage channels should be kept clean of debris and trash. Any settlement should be corrected and repairs of broken or eroded surfaces should be made with appropriate materials.

Refer to [Publication 113, Highway Maintenance Foreman Manual](#), 711-73XX-XX Drainage Cleaning Assemblies for additional information concerning activity requirements and production and planning units.

### **8.3 AUTHORIZATION TO ENTER PRIVATE PROPERTY FOR DRAINAGE ACTIVITIES**

The purpose of this section is to clarify procedures for the Department or its authorized representatives to enter upon any property if entry is necessary to correct, maintain or restore existing drainage facilities.

[Act of Jun 1, 1945, P.L. 1242, Section 417](#) supports the Commonwealth's position and the following policies and procedures discussed in this Chapter concerning this subject. This policy applies in all cases where work is to be done by PennDOT Maintenance Forces or by contractors which have been engaged by PennDOT.

Drainage problems usually result from either a natural impairment (e.g., growth of weeds or siltation) or a physical blockage (intentional or not) by the property owner. In the case of a natural impairment of drainage facilities requiring entry onto private property, the first step should be personal contact with the property owner to explain the problem and our plan to correct it. The District Right-of-Way Unit has "RW" forms that can be used in this situation. PennDOT's representative should request the property owner to sign an [RW-397](#) "Authorization to Enter (Non-Waiver of Claim)" or an [RW-397A](#) "Authorization to Enter (Waiver of Claim)" for PennDOT's protection. However, refusal of the property owner to sign the form does not prevent PennDOT from taking necessary corrective action. If the property owner refuses to allow PennDOT to enter the property to correct the problem, the property owner should be sent a certified letter describing the problem, our plan to correct the problem, and the date we intend to enter. The corrective work should then be performed on the date indicated. Below explains when each form is used. Refer to [Publication 378](#), The Right-of-Way Manual, for more information.

Form [RW-397](#) is typically used where there is no right-of-way plan yet, but one will be developed. The owners are allowing entry onto their land to perform work, but not waiving their compensation claim when the plan is developed, and normal acquisition procedures applied.

Form [RW-397A](#) is typically used where there is no intent to develop a right-of-way plan showing an acquisition of the area. The owners are allowing entry onto their land to perform work, understanding that no compensation will be forthcoming. This form is often used for driveway adjustments and drainage work.

NOTE: If a dangerous condition exists on the highway because of natural impairment, the Maintenance Manager should act as soon as possible to correct the problem. Although the preceding steps are not required, personal contact should be made when and where possible.

The Department has the authority to remove, sever or block drainage structures constructed or altered without a permit or in violation of state regulations. [Publication 282](#), Highway Occupancy Permit Operations Manual, describes the process a property owner needs to go through to make a legal connection to the Department's storm sewer system. In the case of a **physical blockage** caused by the property owner, the first step is also personal contact with the property owner. The property owner should be told the action is in violation of Act of [Jun 1, 1945, P.L. 1242, Sections 420 and 421, 36 P.S. Highway and Bridges §§ 670-421](#) and the problem must be corrected within a reasonable time. If the property owner fails to correct the problem within a reasonable time, the property owner should be sent a certified letter detailing the problem, explaining that it is a violation of state law, and demanding correction within a reasonable time considering the circumstances. Refer to Exhibits 3 and 4. A reasonable time to correct a problem is generally 30 days. If the property owner still does not correct the problem, the District Executive may choose to do the work if it is feasible and bill the property owner per Section 8.5. The property owner must be informed beforehand in writing.

There are scenarios in which the blocked enclosed surface water drainage facility is feasible to reopen and scenarios in which the enclosed surface water drainage facility is unfeasible to reopen. Legal action may become necessary for the Commonwealth to enforce its legal drainage rights, as further explained below.

In cases where increased stormwater from nearby land development resulted in installation of a new drainage system or modification to an existing drainage system, the land developer would be responsible for obtaining appropriate permits and paying for the work. If these systems require further maintenance, the Maintenance Manager should check with the District Permit Manager to determine maintenance responsibilities under the permit. Suggested letters notifying the property owner that the ditch must be opened are included at the end of this Chapter, indicated as Exhibits 3 and 4.

Again, if a dangerous problem exists on the highway because of a blocked enclosed surface water drainage facility, PennDOT should act immediately to correct the problem and the preceding steps are not required. The responsibility for insuring that authorization to enter has been obtained rests with the Maintenance Manager.

## DEFINITIONS

**“Feasible”:** The enclosed surface water drainage facility is easily accessible either in PennDOT right-of-way or on private property, and will not impact buildings or dwellings on the property.

**“Unfeasible”:** The enclosed surface water drainage facility is not easily accessible, or opening it will cause harm to the property. Examples include a pipe that is buried under a building, or the opening of a pipe will release water into a property owner's garage.

## ENCLOSED SURFACE WATER DRAINAGE: FACILITY THAT IS BLOCKED AND FEASIBLE TO REOPEN

Caution should be exercised on private property to prevent damage to any trees, shrubs, etc. when reestablishing drainage facilities. Ditches should be dug only as deep, as wide and as long as necessary to assure flow to or from the pipe invert. Appropriate erosion and sedimentation control measures must be implemented. The placement of additional pipe on private property is not permitted. The property should be left in a clean and well-graded condition.

When opening the pipe under adverse circumstances, communicate with the property owner about the excavated material. Do not, under any circumstances, leave it piled next to the excavated ditch. Leaving the material in a pile next to the ditch has in the past resulted in legal actions against the Commonwealth. Prior to performing work to reopen the enclosed surface water drainage facility, ask the property owner if they prefer the material to be placed on another portion of their property. The Authorization to Enter and Deposit Material form, [M-666](#) and the Environmental Due Diligence form, [D-1](#), shall be properly completed prior to the removal of material. These forms must be on site.

When **replacing pipes**, use the following guidelines:

1. Arrangements for the disposal of waste material should be made in advance of the operation. Under no circumstances shall material be disposed in a wetland, waterway or floodplain or be disposed on private property in such a manner that the material could be graded into any of these areas. Communicate the dump site locations to the crew. The Authorization to Enter and Deposit Material form, [M-666](#) and the Environmental Due Diligence form, [D-1](#), shall be properly completed prior to the placement of material onto private property. These forms require the property owner to follow proper erosion and sedimentation control measures. These forms must be on site.
2. Guidelines concerning the size material of replacement pipe are discussed in Section 8.7 of this Chapter.
3. Pipes should be replaced, if possible, at the same location, direction of flow, etc. If it is determined that an alternate location is more feasible, the pipe may be relocated at our discretion and with the property owner's approval. The outlet at the new location must empty onto the same owner's land as specified in the Deed of Release and Quitclaim ([RW-319](#)). It should be determined that the land needed for the new channel location is owned by the person giving the [RW-319](#). All property owners must sign a Form [RW-319](#) which may be obtained from the District Right-of-Way Unit. In this case, Authorization to Enter form(s) will not be necessary. If it becomes necessary to relocate an outlet onto another property, consult with the District Design Unit.
4. The outlet ditch should be located as shown on the plan, or in the absence of a plan, along the flow line of the existing pipe. The only exception to this is if the property owner has constructed an improvement in the direct line of flow of the pipe such as a home, garage, etc. The outlet ditch may be relocated to avoid the improvement, but should not be located to direct water toward the improvement or toward an adjacent property owner. The property owner must agree to sign an accurate "Deed of Easement", which can be provided by the District Right-Of-Way Unit.
5. Photographs should be taken at the area before the work is performed and after the work is completed. Identify the date, location and name of the person taking the photograph to provide important documented evidence if the property owner claims that damage occurred to shrubs or other parts of their property during the drainage work. Video documentation is permissible. (Video documentation strategy and instruction may be found in [Publication 23, Chapter 15](#), "Weight Restrictions on Highways", "Roadway Inspections.")

### **ENCLOSED SURFACE WATER DRAINAGE FACILITY: DRAINAGE THAT IS BLOCKED AND UNFEASIBLE TO REOPEN**

If the blocked enclosed surface water drainage facility is not an immediate safety concern and unfeasible to reopen, send a letter to the property owner providing them with thirty (30) days' notice that they have interfered with a legal drainage easement and must reestablish drainage at this location (Exhibit 3). Where it becomes necessary to request Legal action by the Office of Chief Counsel, follow the process below:

1. Document the file. The file should include all information needed to establish the Commonwealth's historic drainage rights at that location and explain the nature of the problem. This can include right-of-way plans, straight-line diagrams, aerial and other types of photos or videos, constructions plans and other maintenance records. Additionally, all correspondence with the property owner, their attorneys and any local municipality regarding the matter should also be included.



2. Coordinate with the District Right-of-Way Unit and have the Right-of-Way Administrator send the evidence with a memo to the Utilities and Right-of-Way Section Chief in Central Office asking them to initiate legal trespass actions by virtue of the property owner using PennDOT's easement
3. The Utilities & Right-of-Way Section will forward the package to the Assistant Counsel in-Charge, Right-of-Way & Environmental Section, for assignment of a trial attorney.

## 8.4 DRIVEWAYS AND DRAINAGE PROBLEMS

When an icing, debris or drainage problem is caused by an improperly constructed or maintained driveway, the following policies are established to define and clarify District Maintenance and Permit responsibilities. Should a driveway introduce drainage onto the roadway, the District should notify the property owner to have the problem corrected as soon as possible. This is true even if the driveway was authorized by permit. It is not necessary to determine whether a permit exists before notifying the property owners.

[Act of Jun 1, 1945, P.L. 1242, Sections 420 and 421, 36 P.S. Highway and Bridges §§ 670-421 and 670-420](#), as amended, and [67 PA Code Chapters 441 and 459](#) support PennDOT's position in this matter. [Act of Jun 1, 1945, Section 420](#) empowers PennDOT to make reasonable rules and regulations governing the use of all State highways. [67 PA Code Chapters 441 \(Access to and Occupancy of Highways by Driveways and Local Roads\)](#) and [459 \(Occupancy of Highway by Utilities\)](#) are regulations promulgated under this authority.

[Act of Jun 1, 1945, Section 420\(e\)](#) makes it a summary offense for any person to:

1. Violate any rule or regulation promulgated under authority of [Act of Jun 1, 1945, Section 420](#).
2. Willfully destroy, injure or damage any State highway by any method or device.

[Act of Jun 1, 1945, Section 421](#) makes it unlawful for any person to discharge sewage or drainage, except surface drainage, on or within the legal limits, of any State Highway. Any sewer outlet placed or located within the limits of a State Highway, or so located that the discharge enters a State Highway, is a public nuisance, and may be blocked or removed by PennDOT. Violation of [Act of Jun 1, 1945, Section 421](#) is also a summary criminal offense. Consult with the local Sewage Enforcement Officer to disconnect sewage connections. [See Pub. 282](#) (Highway Occupancy Permit Guidelines) on issuance of permits for drainage facilities.

[67 PA Code, Chapter 441](#) states: "All driveways shall be located, designed and maintained in such a manner as not to interfere or be inconsistent with the design, maintenance and drainage of the highway." A driveway that is draining surface water onto the road surface or shoulders and is damaging the shoulder pavement or causing icing is not being maintained in a manner consistent with the highway's drainage.

If a landowner refuses to correct a driveway drainage problem after being notified, the landowner is violating [Act of Jun 1, 1945, Section 420\(e\)](#) by willfully allowing the damage to continue, whether or not a permit exists. In some cases a permit may authorize drainage onto the highway. If the property owner should introduce the permit as a defense to any court action or revocation proceeding, it can generally be demonstrated that the drainage is a threat to safety and thus provides a basis for modifying the permit.

If a drainage problem causes a clear and present danger to the driving public, (e.g., icing), immediate action should be taken to correct the situation, regardless of whether a permit does or does not exist.

Permit Managers should be notified about any drainage problems related to driveways, but it is not necessary to routinely refer drainage problems to the Permit Manager for resolution. Permit Managers are responsible for enforcing/resolving the terms of the driveway permit. Maintenance Managers are responsible for correcting all drainage problems within the right-of-way.

## 8.5 DRAINAGE MAINTENANCE RESPONSIBILITIES CONCERNING MUNICIPALITIES

Storm water system maintenance has proven complex and contentious throughout PennDOT's history.

Commonwealth statutory and common law has proscribed shared responsibility for the land constituting the State highway right-of-way, which includes shared storm water system responsibility. These responsibilities vary among municipality types as specified in the law.

This policy statement is intended as guidance to PennDOT maintenance staff, not as a binding norm. Statements made herein about the maintenance responsibilities of PennDOT and municipalities are not intended to admit or acknowledge ownership of storm water facilities by PennDOT or any municipality and any such admission or acknowledgement is hereby expressly disclaimed.

See Exhibit 1 “Background for Storm Water Facilities Policy.”

## DEFINITIONS

**Capacity:** The maximum expected quantity of water, created by the peak design storm that can be accommodated at a particular location (inlet, ditch, etc.). Capacity design standards are located within [Chapter 10 of Design Manual Part 2, Publication 13M](#).

**Structural Conditions:** An enclosed surface storm water facility’s strength, structural integrity, plasticity, and fracture toughness. Structural conditions for maintenance purposes include natural deterioration, structural failure, and exceeded design life.

**Surface Drainage:** Surface or sheet flow.

**Surface Water Drainage:** Water from rain that lies or flows on the surface of the earth.

**Subsurface Water Drainage:** Water from beneath the surface of the earth. See Section 8.8 of this Chapter, titled “Subsurface Water Drainage”.

**Surface Water Drainage Facilities:** Roadway crown, shoulder, curbs, gutters, drop inlets, storm drains, ditches/swales and pipes/culverts.

**Open Surface Water Drainage Facilities:** Ditches, swales, gutters, roadway crowns, shoulders, and curbs. See Section 8.2 of this Chapter, titled “Surface Water Drainage.”

**Enclosed Surface Water Drainage Facilities:** Storm water cross pipes/culverts and parallel pipes/culverts including any attached inlets, headwalls, and end walls. See Section 8.6 of this Chapter, titled “Pipes, Culverts, Inlets, Endwalls.”

**Subsurface Water Drainage Facilities:** Pipe underdrains, pavement base drains, subgrade drains, and combination storm sewer and underdrains. PennDOT is generally responsible for these facilities as identified in Section 8.8 of this Chapter, titled “Subsurface Water Drainage”.

**Stormwater Control Measure (SCM):** Physical features used to effectively control, minimize and treat stormwater runoff. The most common SCM types include dry extended detention basins, wet basins, infiltration basins, vegetated swales, infiltration trenches and bioretention (aka, rain gardens). See Section 8.11 of this chapter, titled “Stormwater Control Measures”.

**Projected Curblin:** The extension of an existing curblin across an intersection or short uncurbed section between curbed sections.

## LIMITED ACCESS HIGHWAYS IN ALL MUNICIPALITIES

Drainage facilities installed solely to remove storm water from limited access highways are PennDOT’s responsibility.

## STATE-MAINTAINED BRIDGES IN ALL MUNICIPALITIES

PennDOT is responsible for bridge storm water facilities, except as provided by specific legislation, agreement or order of the Public Utility Commission.



### HIGHWAY OCCUPANCY PERMITS IN ALL MUNICIPALITIES

Under sections [411 and 420 of the Act of June 1, 1945, P.L. 1242](#), any storm water facility installed under a highway occupancy permit (HOP) is the responsibility of the permittee to maintain. PennDOT does not assume responsibility for the maintenance of storm water facilities, curbing, or sidewalk installed by HOP. Detailed policy regarding storm water facility HOPs is located within PennDOT [Publication 282](#). See also Section 8.4 of this Chapter, titled "Driveways and Drainage Problems."

### AGREEMENTS IN ALL MUNICIPALITIES

Legal agreements may exist that establish maintenance responsibility for storm water facilities. These agreements may be for specific facilities or for all facilities within an area. Maintenance of such facilities is as assigned in the agreement. Be guided by Exhibits 5A, 5B, and 6 at the end of this Chapter when addressing planned (design) or unplanned (maintenance) projects and appropriate follow-up actions.

In cases where the Department would need to bill the property owner based on actual cost, cost collection should be handled through a Plant Maintenance work order and a WBS. Use of the work order would be site specific. The Plant Maintenance work order would be the event/site specific cost collector through the use of unique work orders. The WBS would be standard for the storm water effort. Use the following format for the WBS: T-0 STORM 09 WTR – xxxx – 612, where xxxx is the county code. Use revenue code 4453293 for billing purposes.

One type of legal agreement is an Agility Agreement based on intergovernmental cooperation language found in [Act 57, 1998](#). PennDOT’s Agility Program Guidelines are found within [Publication 23, Chapter 23](#). The National Pollutant Discharge Elimination System (NPDES) program and other laws also support the ability to enter into legal agreements with local governments to maintain storm water facilities.

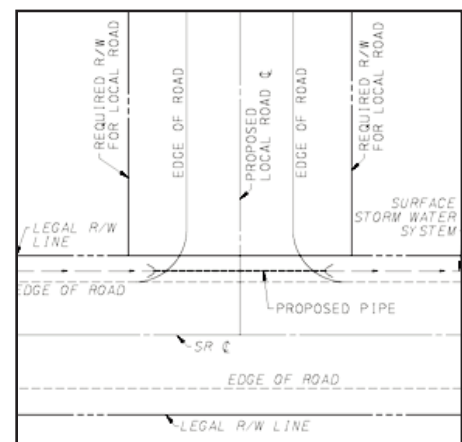
### COMBINATION SEWERS IN ALL MUNICIPALITIES

Storm water facilities that incorporate any type of sanitary wastewater prior to discharging are the responsibility of the local government or other public or private owner to maintain. Some local governments may have combined storm water and sanitary sewer facilities as part of their storm water systems. With the exception of inlet grates forming part of a paved surface, PennDOT will not be responsible for maintaining a combined storm water and sanitary sewer facility under any circumstance.

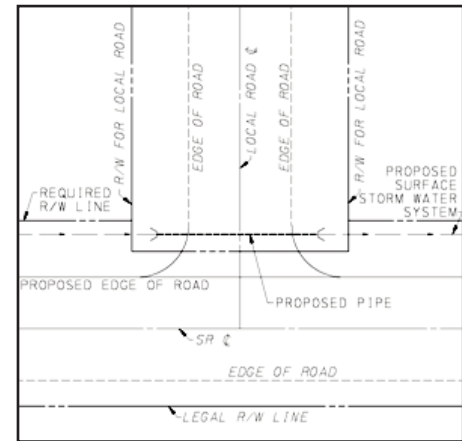
### INTERSECTING STATE AND LOCAL ROADS IN ALL MUNICIPALITIES

The following policy should be followed in maintaining and replacing enclosed surface water drainage facilities parallel to state highways within state right-of-way at intersections with municipal roads. As noted below, there are three categories to be considered.

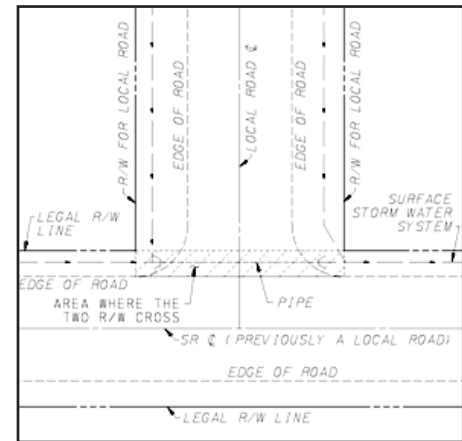
- 1. Category One** involves an existing state road and a local government agency building or reconstructing a local road, or accepting a local road from a developer. [36 P.S. Highway and Bridges, Section 670-420\(b\)](#) clearly provides that "the Secretary may issue permits for the opening of streets and driveways onto state highways.... on terms and conditions established in department regulations...." If a newly constructed or reconstructed local road must traverse a drainage area to access a state highway, the drainage must be properly controlled and any changes in storm water runoff must be addressed. Accordingly, the HOP shall require the municipality to design, construct and maintain any and all affected storm water appurtenances subject to any agreement with the developer and in accordance with [Publication 282](#).



**2. Category Two** involves an existing local road and the construction or reconstruction of a state highway. If the state highway, for its proper drainage, requires the placement of a cross-pipe under the existing local road, PennDOT bears the responsibility for installing the cross-pipe and for maintaining it consistent with the policies outlined below on enclosed surface water drainage facilities in townships and cities, boroughs and incorporated towns, depending on the location of the facility.



**3. Category Three** usually involves two roads which were built by a local government and, by statute, the state assumed jurisdiction of one of these two intersecting roads. Under these circumstances there is joint jurisdiction and responsibility over the intersection area. The state right-of-way includes the paved cartway on the state road and the associated drainage swales. The local right-of-way includes the paved cartway on the local road and the associated drainage swales. The area where the two rights-of-way cross does not become the sole right-of-way of the state. If a cross-pipe serves both the state and local road and there exists joint responsibility for the maintenance of this cross-pipe, an agreement may be reached with the local government to cooperate in the joint maintenance of the cross-pipe under the Agility Program or by separate agreement.



## OPEN SURFACE WATER DRAINAGE FACILITIES IN CITIES, BOROUGHS AND INCORPORATED TOWNS

PennDOT's maintenance responsibility for open surface water drainage facilities is between curblines (actual or projected), including inlet grates in the roadway surface. PennDOT will not perform any maintenance beyond the curblines except to maintain the structural integrity of the highway, such as slopes, walls, etc. If the capacity of an open surface water drainage facility is compromised by upgrade surface water drainage not from the State highway, PennDOT reserves the right to take appropriate action against the private party or local government that caused or failed to prevent the capacity issue. See Section 8.10 of this Chapter, titled "Illicit Discharge Detection and Elimination."

## OPEN SURFACE WATER DRAINAGE FACILITIES IN TOWNSHIPS

PennDOT will maintain all open surface water drainage facilities within the right of way, including inlet grates in the roadway surface. Districts are encouraged to use grass swales when possible rather than curbing. Curbing is not always necessary, particularly in areas of unrestricted right-of-way and topography.

Depending on physical limitations, shoulders can be designed to accommodate pedestrians and bicyclists, if necessary, using wider, flatter areas and dedicated bike lanes. Sidewalks can also be set back from the roadway as to eliminate the need for curbing and its associated enclosed surface water drainage facilities.

When an enclosed surface water drainage facility is opened, the District must report the change to the Chief of the Maintenance Technical Leadership Division, Bureau of Maintenance and Operations (BOMO). BOMO will maintain a list of these changes. If the capacity of an open surface water drainage facility is compromised by upgrade surface water drainage not from the State highway, PennDOT reserves the right to take appropriate action against the private party or local government that caused or failed to prevent the capacity issue. See Section 8.10 of this Chapter, titled "Illicit Discharge Detection and Elimination."

## WORK OUTSIDE PENNDOT LEGAL RIGHT OF WAY

PennDOT will not perform storm water maintenance activities outside the legal right-of-way, except to exercise rights granted under the "Ditch and Drainage Act," [36 P.S. Highway and Bridges, Section 670-417](#), to reestablish drainage flow. Once drainage flow is established, maintenance activities will cease, except for any continuing obligations imposed by environmental permitting. When performing activities off PennDOT right-of-way, employees or contractors must follow the procedures set forth in Section 8.3 of this Chapter, titled "Authorization to Enter Private Property for Drainage Activities."

## ENCLOSED SURFACE WATER DRAINAGE FACILITIES IN CITIES, BOROUGHES AND INCORPORATED TOWNS

PennDOT does not maintain enclosed surface water drainage facilities within cities, boroughs and incorporated towns. This includes inlets below grates, cross pipes/culverts, parallel pipes/culverts, headwalls and endwalls unless PennDOT has assumed maintenance by agreement, or has installed facilities located in 1st or 2nd Class Cities.

Street cleaning and sweeping at and along curb lines (actual and projected) is considered to be a drainage function of cross and parallel pipes within the curb section. The Department, through past practice or agreement, may sweep these sections but is not obligated to do so.

If there is an emergency condition involving public safety where the integrity of the road surface has been compromised due to the failure of a local government to maintain an enclosed surface water drainage system, PennDOT may correct the condition and bill the local government for the cost of the work.

PennDOT's discretionary authority to install enclosed surface water drainage facilities in 1st and 2nd Class Cities must be exercised in a limited manner and only if the City agrees to future maintenance, in writing.

## ENCLOSED SURFACE WATER DRAINAGE FACILITIES IN TOWNSHIPS

Maintenance activities may occur under four circumstances: deficiencies relating to structural conditions; lack of capacity; routine maintenance; and emergency repairs. PennDOT will maintain enclosed surface water drainage facilities of the state highway within townships for structural conditions, but not lack of capacity.

- 1. Structural conditions.** PennDOT's responsibility for deficiencies relating to structural conditions includes the repair and replacement of inlets below grates, cross pipes/culverts, parallel pipes/culverts, headwalls and endwalls for structural condition reasons unless the township has assumed maintenance by written agreement or HOP, a combination or system with treatment facilities is involved, or there is joint responsibility at intersecting roads. PennDOT may, where it is feasible and safe, remove, reconstruct, or replace deteriorated parallel pipes with appropriate grass or similar swales or other alternative drainage designs in accordance with all storm water management requirements. PennDOT will notify the township in writing 30 days in advance of replacement, (see Exhibit 14) if feasible, in order for the township to properly assess and comment. If the township does not desire the piping to be replaced by a grass swale, the township must assume complete maintenance responsibility for the parallel pipes by HOP or legal agreement. The abutting land owner can be a co-applicant on such an HOP. The complete maintenance responsibility assumed by the township will be limited to the facilities that PennDOT would have otherwise replaced with a grass or similar swale or other alternative designs. Both PennDOT and the township will make every effort in good faith to resolve any disputes over the feasibility and safety of these alternatives.

Districts must determine enclosed surface water drainage facility replacement needs based upon safety concerns to the traveling public and the integrity of the surface of the highway; the willingness of the local government and abutting property owners to partner; and the priority of roadway resurfacing needs under the Transportation Improvement Program (TIP) and County Maintenance Surfacing Improvement Program.

**2. Lack of capacity.** Townships are responsible when cross or parallel pipes must be repaired or replaced due to lack of capacity. A repair or replacement due to lack of capacity shall mean the repair or replacement of enclosed surface water drainage facilities because the facility can no longer accommodate increased storm water flows from upstream development that occurred since the roadway was established and the storm water facility was originally installed. The owners or occupiers of property abutting those facilities shall be required to maintain their storm water on their property or repair or replace the facility, thus requiring an HOP. Lack of capacity does not include failures that occur during storm events that exceed design intensity and duration standards as defined in [Publication 13M](#). Such capacity issues usually arise when storm water issues are not properly addressed in the land development process or where a property owner has altered drainage courses on their property which cause a re-direction or increased flow towards the highway.

**3. Routine maintenance.** Routine maintenance involves, as necessary, removal of leaves and other obstructions from and at the enclosed facilities and may involve street cleaning and sweeping. It does not include the repair or replacement of enclosed surface water drainage facilities for structural conditions.

Routine maintenance of enclosed surface water drainage facilities may be addressed under PennDOT's Agility Program. If the Agility Program is not used, the past practice of the township and PennDOT with respect to those facilities will determine who is responsible for routine maintenance. If a formal written agreement for maintenance between PennDOT and the township does not exist, one should be drawn up and signed by both parties. Refer to the [Drainage Facilities Maintenance Agreement Template](#) and the [checklist](#) located on the Pennsylvania SharePoint, Office of Chief Council.

**4. Emergency repairs.** If there is an emergency condition involving public safety or where the integrity of the road surface has been compromised due to the failure of a township to maintain an enclosed surface water drainage system for which it is responsible, PennDOT may correct the condition. PennDOT reserves the right to bill the township for the associated costs if it gave prior notice to the township.

## 8.6 PIPES, CULVERTS, INLETS, ENDWALLS

Highway maintenance activities that are generally performed by PennDOT forces and are associated with pipes, culverts, inlets, and endwalls include the following:

1. Cleaning pipes and culverts (Assembly 711-7314-01).
2. Cleaning inlets and endwalls (Assembly 711-7311-01).
3. Repair and/or replacement of inlets and endwalls (Assemblies 711-7321-01 and 711-7321-02).
4. Replacement of pipes and culverts (Assemblies 711-7324-01 and 711-7324-02).

All activities can be found in the [Highway Foreman Manual, Pub. 113](#). PennDOT's objective is to maintain the above referenced structures in a condition to efficiently carry away collected surface and/or subsurface water.

Surface water that does not drain from the roadway surface and the shoulder or subsurface water that reaches the roadway during periods of freezing weather can accelerate pavement deterioration and result in ponding and icing. [Publication 23, Chapter 4](#) provides guidance for treating and signing such locations as a temporary remedy.

Annual inspections should be made after the snow and ice season and routine inspections after heavy rains. PennDOT maintenance employees should watch for signs of drainage problems or failures whenever they travel the roadways.

Inlets and endwalls should be checked to determine if any structural repair work is necessary. Frames and grates should be properly seated. Pipe culverts should be checked for condition of pipe, alignment of inlet and outlet ditches and for blockages.



Necessary repairs to concrete and masonry structures should be made as required to provide structurally sound units. Replacement of inlets and endwalls should be made in accordance with Section 605 of [Publication 408](#) and Standard Drawings [Publication 72M RC-31M, RC-45M and RC-46M](#).

Culverts should be kept reasonably clean and unobstructed. Obstructions and sediment deposits should be removed as quickly as practical. Inlet and outlet channels should be properly aligned and maintained so that culverts can function to capacity. Often the inlet channel needs realignment to prevent sedimentation. Areas around culvert inlets and outlets should be controlled to limit vegetation and permit free flow of water.

It may be necessary to clean debris from a channel or natural water course beyond the right-of-way line to keep rains from washing material into a culvert inlet. Written permission should be obtained from the property owner before entering private property to clean up debris. (Refer to discussion in Section 8.3 on "Authorization to Enter Private Property"). A permit may be required if channel was not designed as a stormwater conveyance and has a defined bed and bank.

Clogging of pipe by silt, leaves, or other debris is a common occurrence. The solution for the leaves and other debris is frequent cleaning. If silting continues to occur, consideration should be given to determining the cause or source of the erosion and stabilizing where appropriate to preclude the introduction of silt and debris to the drainage system.

Scour at inlet ends of pipe is caused by turbulence that results when more water is collected at the inlet than can rapidly be discharged by the pipe. When water collects at the inlet end of pipe culverts, the cause should be determined and the necessary correction should be made promptly to prevent culvert failure. If the ground is not protected, a headwall, pipe end section, or riprap should be installed. The safety implications of placing a fixed, blunt object such as a headwall adjacent to traffic must also be evaluated. Refer to [Publication 13M, Section 10.3.B.6](#) for clear zone requirements.

Scour at a pipe outfall is caused by excessive flow velocity coupled with lack of channel armoring. Undermining and failure of the outlet headwall can result from such scouring. When scour occurs at the outlet end of a pipe culvert, the alternatives for correcting this condition are to build a concrete or stone apron on the spillway beneath the end of the pipe or to construct an energy dissipater in accordance with [Publication 72M, Standard Drawing RC-72M](#).

References to be reviewed when replacing pipe include the following:

1. [Publication 408](#), Sections 601 to 605.
2. [Publication 13M, Design Manual, Part 2, Chapter 10](#), "Drainage Design and Related Procedures".
3. [Publication 113](#) (Highway Foreman Manual) Performance Standards for Activity 711-7324 and Related Quality Assurance Review Format for Pipe Replacement.
4. [Publication 584](#), "PennDOT Drainage Manual, for design related information."

## 8.7 PIPE REPLACEMENT

Pipe materials naturally degrade over time and make replacement inevitable. However, numerous physical and environmental factors can accelerate deterioration or cause damage. It is important to identify the type of pipe failure and determine the cause(s) when replacing a pipe. The type and cause of failure should influence the selection and installation of the pipe replacement.

### Factors that influence pipe deterioration and damage

Physical	Material	Pipes made from different materials fail in different ways.
	Wall thickness	Corrosion will penetrate thinner walled pipes more quickly.
	Age	Effects of pipe degradation become more apparent over time.
	Diameter	Small diameter pipes are more susceptible to beam failure.
	Lining and coating	Lined and coated pipes are less susceptible to corrosion.



	Installation	Poor practices, such as inadequate sealing of joints and improper bedding, can make the pipe vulnerable to failure.
	Cover	Inadequate cover increases loading on pipe.
	Exposure	Exposed pipe ends are susceptible to damage from blunt force.
Environmental	Trench backfill	Some backfill materials are corrosive or frost susceptible.
	Soil type	Some soils are corrosive; some soils experience significant shrink/swell, resulting in changes to pipe loading. Hydrocarbons and solvents in soil may result in some pipe deterioration.
	Groundwater	Some groundwater is aggressive toward certain pipe materials.
	Pipe location	Migration of road salt into soil can increase the rate of corrosion.
	Disturbances	Underground disturbances in the immediate vicinity of an existing pipe can change the support and loading structure on the pipe.
	Leakage	Pipe leakage can erode pipe bedding and increases soil moisture around the pipe.
	Undermining	Undermining of pipe ends from erosion and scour causes instability.

When replacing a pipe that is connected to a series of storm inlets and pipes, a hydraulic capacity analysis is normally not required. Parallel pipes, cross pipes, and slope pipes are all connected to a storm inlet or manhole and often part of a larger system. The performance of the system is affected by all of the system components. Unless the entire system is being replaced, the pipe may be replaced in-kind (same diameter and material) or improved (larger diameter and/or smoother).

When replacing a pipe culvert, it cannot be assumed that the existing pipe has adequate capacity and can be replaced in-kind. The minimum diameter of storm pipe that may be installed is 18 inches (see Section 10.3.B of [Publication 13M](#) and Assembly 711-7324-01 in [Publication 113](#)). If the existing pipe is less than 18 inches, it must be replaced with a pipe having a diameter of 18 inches or greater. Installation of a pipe culvert 15 inches in diameter or less is not permitted without ADE-Maintenance approval.

[Publication 13M](#) also states that hydraulic design computations are required for all pipes with a diameter of 18 inches or greater (Section 10.3.H). In limited circumstances, the existing pipe culvert may be assumed to be adequate. Exhibit 21 may be used to determine when a pipe culvert can be replaced in-kind without performing hydraulic calculations.

All replacements of pipe culverts and pipe outfalls from storm sewer systems should be evaluated for permit requirements. Environmental permits are discussed later in this section.

As discussed in [Publication 408](#), the joining of individual pipe sections requires additional emphasis. If the sections are not joined properly, water will seep through the joints and into the bedding, thus causing erosion and settlement and additional associated maintenance problems.

**Table 1: Soil pH and Resistivity**

COATING	SOIL pH	RESISTIVITY Ohm-cm
Aluminum Alloy (Uncoated)	4.0 to 8.5	>1500
Concrete (Uncoated)	4.0 or Greater	All
Concrete (Epoxy Lined)	<4.0	All
Plastic	All	All
*Steel (Metallic Coated)	5.5 to 8.5	>6000
*Steel (Polymer-Type B )	4.0 to 8.5	2000 to 6000
*Steel (Polymer-Type C )	<8.5	<6000
*Steel (Fiber Bonded )	4.0 to 8.5	2000
*Stainless Steel	<4.0	<6000
*Not shown in DM-2		

The use of approved "pipe liners" should also be considered when the condition of the existing deteriorated pipe will allow the introduction of a "liner" without adversely constricting the flow. Primary candidates for this treatment may include cross drains located under significant depths of fill and/or in areas of heavy traffic where detouring is not an option and operational width is a concern. Hydraulic analyses comparing the existing and proposed (lined) conditions should be part of the decision making process.

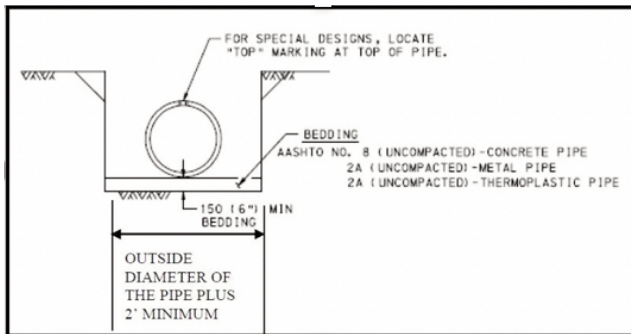
Excessive acidity or alkalinity of water or surrounding soil may exist and cause corrosion of metal pipes and deterioration of steel reinforced concrete pipes, thus accelerating the need for replacing the pipe. The pH value of the water or soil should be determined before a pipe is replaced. See Table 1 for the selection of pipe types based on pH values of the water and the pH and resistivity values of the soil:

In areas where abrasive flow conditions exist, metal-coated or uncoated pipe should have a paved invert; concrete pipe should be epoxy lined; and plastic pipe should be double-walled, smooth-lined corrugated polyethylene pipe.

Maintenance and repair includes slip lining or clearing the structure of blockages of sediment or debris.

### CROSS PIPE INSTALLATION

When installing cross pipe drainage of 48" or less on state owned roadways, the trench width shall be a minimum of two (2) feet wider than the outside diameter of the pipe. See diagram.



Mark and saw cut the roadway to the full depth of existing pavement.

Excavate the trench to the width of the outside diameter of the pipe barrel plus 2 feet and create bedding to a minimum 6 inches in depth (for concrete pipe use AASHTO #8 uncompacted, the end section shall be compacted 2A, for metal and thermoplastic use 2A uncompacted). When required, lay pipe on a prepared cradle.

Trenches 5 feet deep or greater require a protective system unless the excavation is made entirely in stable rock. If less than 5 feet deep, a competent person may determine that a protective system is not required. Trenches 20 feet deep or greater require that the protective system be designed by a registered professional engineer or be based on tabulated data prepared and/or approved by a registered professional engineer in accordance with [CFR 1926.652\(b\) and \(c\)](#).

### PROTECTIVE SYSTEMS

There are different types of protective systems.

- **Benching** – a method of protecting workers from cave-ins by excavating the sides on an excavation to form one or a series of horizontal levels or steps, usually with vertical or near vertical surfaces between levels. Benching cannot be done in Type C soil. Per OSHA, Type C soil includes any of the following:
  - Cohesive soil with an unconfined compressive strength of 0.5 tsf or less
  - Granular soils (gravel, sand, loamy sand)
  - Submerged soil or soil from which water is freely seeping
  - Submerged rock that is not stable
  - Material in a sloped, layered system where the layers dip into the excavation on a slope of 4H:1V or steeper

- **Sloping** – involves cutting back the trench wall at an angle inclined away from the excavation.
- **Shoring** – requires installing an aluminum hydraulic shoring or other types of supports to prevent soil movement and cave-ins.
- **Shielding** – protects workers by using trench boxes or other types of supports to prevent soil cave-ins. Designing a protective system can be complex because you must consider many factors: soil classification, depth of cut, water content of soil, changes caused by weather or climate, surcharge loads (e.g., spoil, other materials to be used in the trench) and other operations in the vicinity.

Lay the pipe on appropriate bedding, achieving a minimum of a ¼ inch per foot slope overall.

Place backfill with 2A coarse aggregate material in lifts 4 inches in depth; 8-inch loose lifts can be placed when vibratory compaction equipment is used. Two upright compactors or vibratory compaction equipment shall be used to compact the backfill material until little or no evidence of backfill movement remains beneath the compaction device. Do not compact over the centerline of the plastic and metal pipe until there is a minimum of 12 inches of cover.

There shall be a minimum of 1 foot of cover from the top of the pipe to the bottom of the base course. If fill height on top of pipe is under 3 feet, should consider endwalls to anchor each end of the pipe due to buoyancy of plastic pipe, once submerged, during a flooding event.

Additional saw cuts shall be made on each side of the pipe trench prior to patching. Saw cuts shall be 1 foot or greater than the original excavation or from any damaged area. The thickness of the bituminous material placed in the trench shall be equal to the existing pavement or a minimum of 6 inches in depth if the existing pavement is greater than 6 inches.

## ENVIRONMENTAL PERMITS

The Department of [Environmental Protection 25 PA Code, Chapter 105 Regulations](#), (Dam Safety and Waterway Management) may require that a Water Obstruction or Encroachment permit or approval be obtained prior to maintenance, repair, replacement, or removal activities as well as prior to installation of a new or larger structure involving waters of the Commonwealth (e.g., streams and wetlands). Refer to [Publication 783](#), Environmental Permitting Handbook for guidelines on all permits used by the Department.

When applying for Exx-9999 Maintenance Force permits, GP 11 permits, Small Projects permits, and Individual Obstruction and Encroachment permits, the application must be submitted to DEP electronically using the Keystone Environmental ePermitting System (KEeS). For more information on General Permits, refer to [Publication 783, Appendix F, Chapter 105 General Permit Quick Reference Guide](#).

PennDOT is often faced with emergency conditions. An emergency condition exists when the safety of the structure is threatened and action is necessary to protect life, property, or the environment from that structure's failure. In addition, an emergency condition exists after a structure is closed if that structure is on a necessary route for emergency vehicles to respond to other types of emergencies, such as house fires or medical emergencies requiring ambulances. For emergency conditions, the Bridge Maintenance Coordinator or District Permits Coordinator should verbally contact DEP immediately to request an Emergency Permit. Refer to [Publication 783](#) for additional information.

## 8.8 SUBSURFACE WATER DRAINAGE

In addition to providing facilities for draining water from surface areas of the highway, it is also important to provide drainage for the removal of water from beneath the surface. Subsurface water conditions can be more damaging than surface water conditions. Subsurface water can soften the subgrade of a pavement causing weakness and eventual failure of the pavement. Roadside problems such as sink holes, landslides, and rock falls can also result from excessive amounts of subsurface water.

All subsurface water must be drained away from the highway. Subsurface drains should have free flowing outlets, and should be located to direct water to a watercourse such as a parallel ditch or stream. Properly

functioning drainage will prevent subsurface water from collecting under the roadway or reaching the surface of the roadway.

The following types of subsurface drains are shown on [Standard Drawing RC-30M](#) and are specified in Sections 610 and 612 of [Publication 408](#):

1. Pipe Underdrain
2. Pavement Base Drain
3. Subgrade Drain
4. Combination Storm Sewer and Underdrain

Also noted are subsurface drain outlets that serve the purpose of outletting the underdrain. Pipe underdrains are generally used to:

1. Drain springs and cut off seepage in the original ground either under an embankment, or along benches where the highway is located on the side of a hill.
2. Lower the ground water level so that it will be below the surface of the subgrade.
3. Provide an outlet for water that gets into the base course and subbase.

Frequent inspection of subsurface drains is very important. Subsurface drains must have outlets and these outlets must be kept open. Otherwise the subsurface drain acts as a reservoir for water and does more harm than good.

Information concerning pipe size and proper spacing of outlets can be found in the [Publication 13M, Design Manual, Part 2, Chapter 10](#).

All repair and replacement work of subsurface drains should be done in accordance with the associated [Publication 72M](#), Roadway Construction Standards and [Publication 408](#), Specifications previously referenced in this section. For proper delineation reference [Publication 111, TC-8604](#).

## 8.9 EROSION AND SEDIMENT POLLUTION CONTROL

The [PA Clean Streams Law](#) authorizes the regulation of activities that create or have the potential to create pollution in the waters of the Commonwealth. [25 PA Code, Chapter 102](#) (Erosion and Sediment Control) regulates earth disturbing activities such as highway maintenance to prevent accelerated erosion and the resulting sediment pollution. The requirements of [25 PA Code, Chapter 102](#) are described in [Publication 783](#), Environmental Permitting Handbook. In general, an NPDES permit is required for projects that involve one acre or more of earth disturbance activities. [25 PA Code, Chapter 102](#) Permits are different than the General Permits. Refer to Exhibit 20, Proposed Earth Disturbance for more guidance.

Road Maintenance Activities which result in less than 25 acres of earth disturbance are exempt from obtaining a permit pursuant to [25 PA Code, Chapter 102](#). Road Maintenance Activities are defined in [25 PA Code, Chapter 102](#) as earth disturbance activities within the existing road cross section or railroad right-of-way including the following:

- A. Shaping or restabilizing unpaved roads.
- B. Shoulder grading.
- C. Slope stabilization.
- D. Cutting of existing cut slopes.
- E. Inlet and endwall cleaning.
- F. Reshaping and cleaning drainage ditches and swales.
- G. Pipe cleaning.
- H. Pipe replacement.

- I. Support activities incidental to resurfacing activities such as minor vertical adjustments to meet grade of resurfaced areas.
- J. Ballast cleaning.
- K. Laying additional ballast.
- L. Replacing ballast, ties, and rails.
- M. Other similar activities.

The existing road cross-section consists of the original graded area between the existing toes of fill slopes and tops of cut slopes on either side of the road and any associated drainage features.

[Publication 584, Chapter 12, Appendix E](#) contains common examples of PennDOT maintenance work along with descriptions of what is considered a Road Maintenance Activity (not to be included as earth disturbance area for NPDES permitting purposes). It also provides clarification regarding what is not considered Road Maintenance Activity and must be included to determine whether 1 acre of earth disturbance will occur, and thus, an NPDES permit will be required.

E&S Best Management Practices (BMPs) must be used for all projects regardless of whether or not an Erosion and Sediment Pollution Control (E&S) Plan or permit is required.

Maintenance shall:

1. Review proposed drainage work to determine applicability of permits.
2. Follow E&S Best Management Practices for all projects.
3. Coordinate with the County Conservation District to review proposed work plans.

The Districts shall communicate with each County Conservation District (CCD) the proposed work plan. Additional meetings may be conducted as required. Refer to [Publication 783, Appendix C, Exhibit C](#) for addresses and phone numbers.

For projects where a written E&S Plan is required, the E&S Plan should contain the project name, municipality, county, project plan (showing streams, wetlands, and BMP locations), name and address of person responsible for the E&S controls, and the name, address, phone number and signature of the person who prepared the E&S Plan. Details of each BMP should be attached as part of the E&S Plan. Refer to [Publication 464](#) (Maintenance Field Reference for Erosion and Sediment Control) for information on BMP details. Additional information can be found in PA DEP's [Erosion and Sediment Pollution Control Program Manual \(Technical Guidance Number 363-2134-008\)](#) or [Chapter 12 of the PennDOT Drainage Manual \(Publication 584\)](#). In cases where there are technical questions relative to the design and of E&S BMP's, the District Environmental Permits Coordinator should be consulted. The CCD may also be consulted.

In order to ensure that E&S BMP's are properly implemented, the CCD (and/or PA DEP) will periodically inspect Department maintenance activities and forward inspection reports to the Maintenance Manager. If deficiencies are noted and corrective measures are necessary, a mutually agreed upon deadline will be given to correct the conditions. Re-inspection will be conducted by the County Conservation District and/or PA DEP. In the event a problem cannot be resolved at the county level, the Assistant District Executive for Maintenance (for the District Executive) and the appropriate PA DEP Regional Office will receive a copy of the inspection report from the County Conservation District. These parties will initiate coordination to satisfactorily resolve the problem. If resolution cannot be reached at this level, the District will contact the Director of the Bureau of Maintenance and Operation (for the Deputy Secretary for Highway Administration) to resolve the problem.

In instances where transportation facilities are affected by erosion and sedimentation from outside the Department right-of-way, the Maintenance Manager should notify the CCD or PA DEP Regional Office of the problem and request that appropriate action be taken.



## 8.10 ILLICIT DISCHARGE DETECTION AND ELIMINATION

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The NPDES regulations require that publicly owned municipal separate storm sewer systems (MS4) in designated urbanized areas develop processes to detect and eliminate illicit discharges. PennDOT's storm water systems located in urbanized areas are subject to these requirements. Urbanized areas are defined by the U.S. Census. PennDOT's 2005 and 2011 MS4 permits utilize the 2000 census to identify the urban areas; PennDOT's next MS4 permit is expected to utilize the 2010 census. The following links will help identify the urbanized areas in the various PennDOT Districts:

[Maintenance IQ](#), [PennDOT OneMap](#) or [eMapPA](#)

Illicit discharges are defined as any discharge to PennDOT's MS4 that is not composed entirely of storm water and are not permitted pursuant to another type of NPDES permit (e.g., NPDES permit for industrial activities). PennDOT's NPDES MS4 Permit is intended to minimize contamination entering the highway/ bridge storm water system in urbanized areas and discharging into the Waters of the Commonwealth. The permit's Minimum Control Measure #3, Illicit Discharge Detection and Elimination (IDDE), requires PennDOT to conduct inspections of outfalls located within regulated urbanized areas and to report any dry weather, illicit discharges to the PADEP for enforcement. The permit defines "outfall" as a "Point Source at the point where an MS4 discharges to surface water of this Commonwealth." Exhibit 19 outlines the Potential Illicit Discharge Detection and Elimination Reporting Process.

This reporting requirement is required of all PennDOT and Consultant personnel acting on PennDOT's behalf. All personnel that have occasion to observe field conditions, whether in a construction inspection, maintenance, design field view, or any other capacity, should report Potential Illicit Discharges (PIDs) into systems owned and/or operated by PennDOT which are designated or used for collecting storm water associated with PennDOT's roads, highways, bridges, and related structures **when observed during their normal job duties**. If PennDOT or consultant personnel detect a PID, the following actions should be taken:

- Observe and document the dry weather characteristics of the discharge including color, odor, turbidity, sheen/scum, flow (steady or intermittent), presence of debris or sewage, and the conditions of the surrounding and impacted vegetation.
- Make reasonable efforts within PennDOT's authority to trace the discharge to determine whether the source is the result of improper dumping or from a property owner with an improper physical connection to PennDOT's storm sewer system.
- Document the situation using photography and/or videography.
- Attempt to identify the property owner.

The results of these efforts should be documented on the Illicit Discharge Reporting Form (IDRF) [M-12](#) (Exhibit 15). These forms are available at all County Maintenance offices, Welcome Centers, and Safety Rest Areas, and at BOMO's Stormwater webpage. PennDOT personnel should send completed forms to their District SEMP Manager; when necessary, the SEMP Manager will then forward the information to BOMO SEMP staff by emailing the completed form to the IDDE resource account email: [RA-pdIDDE@pa.gov](mailto:RA-pdIDDE@pa.gov).

Consultant personnel should submit the forms to their PennDOT direct report person, or the District SEMP Manager. The District SEMP staff will prioritize the PIDs detected and determine whether the PID occurs in an urbanized area. District SEMP staff will begin follow-up action including a letter to the property owner requesting the termination of pollutant source.

If it is determined through observations that a PID exists in an urbanized area and PennDOT has information regarding the property owner of the source of the PID, the District will send a notice to the property owner requesting the elimination of the discharge. The property owner will be given 30 days to respond to PennDOT. If the property owner refuses to eliminate the discharge or fails to respond to the notice within 30 days, the District should forward the IDRD, photos and Property Owner Termination Letter to BOMO SEMP staff via the resource account email. The BOMO SEMP staff will report the PID to the Clean Water Program of the

appropriate PADEP regional office for enforcement.

Exhibits 16, 17 and 18 are template letters that can be used as a guide in drafting the notices to the property owners. Exhibit 16 is for situations involving a PID with an unauthorized connection to the Department's drainage system. Exhibit 17 is for situations involving a PID with an authorized (or no) connection to the Department's drainage system. Exhibit 18 is for situations involving a PID sump pump effluent to the Department's drainage system. The letter should be sent to the property owner by way of certified mail, return receipt requested to the property owner. If the certified letter is returned undelivered, resend the letter to the property owner by way of regular mail.

If it is determined through observations that a PID exists but PennDOT is unable to determine the source of the discharge, BOMO's SEMP staff will report the potential illicit discharge to the Clean Water Program in the appropriate PADEP regional office for enforcement. PennDOT's report to the PADEP regional office should include:

- the location of the discharge
- nature of the discharge
- immediate observable environmental impacts
- whether the discharge needs to be eliminated for a PennDOT maintenance or construction project

If the PID was detected, confirmed as an illicit discharge, and needs to be eliminated for a PennDOT maintenance or construction project, BOMO's SEMP staff will also telephone the contact for the Clean Water Program in the regional office to relay this information to identify the discharge as a priority. This will help PADEP regional staff to prioritize and address the PID if multiple PIDs have been reported to the regional office.

PennDOT's responsibilities under its NPDES MS4 permit for IDDE are satisfied once the illicit discharge is terminated or is reported to PADEP's Clean Water Program. The requirements of PennDOT's MS4 permit do not apply to discharges in non-urbanized areas. These procedures should, however, be applied in non-urbanized areas to eliminate illicit discharges when needed for maintenance or construction projects, or where other immediate recognizable environmental concern exists.

Refer to the Illicit Discharge Reporting Form (IDRF) [M-12](#) (Exhibit 15) for examples of illicit discharges.

## 8.11 STORMWATER CONTROL MEASURES

### BACKGROUND

The Pennsylvania Department of Transportation (Department or PennDOT) installs Stormwater Control Measures (SCMs) to control stormwater runoff from the highway system and supporting facilities owned by the Department. SCMs are physical features designed to slow down, reduce, and/or treat stormwater runoff before it enters waterbodies and groundwater. These features are a subset of stormwater Best Management Practices (BMPs), which are effective and practical means of preventing or minimizing pollution. BMPs include physical features as well as design approaches applied to the project prior to construction.

### MAINTENANCE

SCMs require routine maintenance, periodic inspections, and as-needed corrective maintenance to ensure they continue to function as designed. If SCMs are not functioning properly, adverse environmental impacts such as downstream pollution and erosion can occur. A successful SCM maintenance program includes a variety of elements:

- Standardizing processes so the program is applied consistently across all Counties and Districts.
- Educating staff on the program and providing training for staff to perform their specific duties.
- Communicating efforts between Design, Construction, and Maintenance.
- Providing an accurate inventory of SCMs to owners and operators.
- Performing preventative maintenance on routine schedules.

- Performing corrective maintenance activities as needed in a timely manner.
- Conducting periodic inspections to identify problems and evaluate maintenance practices.
- Documenting program efforts for quality improvement and to maintain regulatory compliance.
- Effective enforcement of the policy.

[Publication 888](#), “Stormwater Control Measure Maintenance Manual”, serves as the primary reference for all policies and procedures related to inspection and maintenance of SCMs. It addresses required activities Maintenance is responsible for throughout the SCMs life cycle. Department personnel at District and County levels can find information about required activities, subsequent reporting, and recordkeeping.

**EXHIBIT 1**Background for Storm Water Facilities Policy

The Department has historically implemented a curb-to-curb maintenance policy as to State highways based on the provisions of the [State Highway Law of 1945, 36 P.S. Highway and Bridges §670-101](#) et seq., relating to designation of local roads as State highways. Responsibility was divided between the Department and the local government through which the State highway traverses. The underlying legal provisions are tied to the type of municipality in which the State highway is located (i.e. a city, borough, town, or township). The [State Highway Law of 1945](#) refers to State highways in townships as the Rural State Highway System.

The statutory provisions in the [State Highway Law of 1945](#) can be summarized as follows:

- a. Cities of the 1st and 2nd Class: [Section 542 of the Act of Jun 1, 1945, P.L. 1242, 36 P.S. Highway and Bridges § 670-542](#), provides that the Department's maintenance responsibility does not include "the curbing and footways" of any adopted State highway or the responsibility "to remove snow or keep streets clean." In addition, "repairs and maintenance shall be of such type as shall be determined by the secretary." If necessary, the Department, pursuant to [Section 543 of the Act of Jun 1, 1945, P.L. 1242, 36 P.S. Highway and Bridges § 670-543](#), can elect to construct "storm water conduits, drains and gutters, culverts, bridges, viaducts and retaining walls, curbing and recurbing...excepting water pipe and sanitary sewers." Because items installed pursuant to the Department's discretionary authority will be the Department's future responsibility to maintain, the Department has always exercised that authority in a limited manner, and the policy has always been that storm water drainage facilities should not be installed unless the City has agreed to future maintenance, in writing.
- b. Cities of the 2nd A and 3rd Class: [Section 522 of the Act of Jun 1, 1945, P.L. 1242, 36 P.S. Highway and Bridges § 670-522](#), provides that the Department's maintenance responsibility is limited to the areas "between curb lines as established at the time of the passage of the act by which the street was designated a state highway" or where the Secretary of Transportation otherwise designates the curb lines. "Repairs and maintenance shall be of such type as shall be determined by the Secretary." Also, according to [Section 521 of the Act of Jun 1, 1945, P.L. 1242, 36 P.S. Highway and Bridges §670-521](#), in these cities the Department's responsibility does not extend to "maintenance, construction, reconstruction or resurfacing of said streets other than the base and surface courses" or to "any structure of any kind or character whatsoever," including " storm and sanitary sewers."
- c. Boroughs and Incorporated Towns: [Section 513 of the Act of Jun 1, 1945, P.L. 1242, 36 P.S. Highway and Bridges § 670-513](#), gives the Secretary of Transportation the power to determine the width and type of maintenance activities the Department will perform. The Department's maintenance policy has therefore always excluded maintenance of storm and sanitary sewers in boroughs.
- d. Townships: [Section 502 of the Act of Jun 1, 1945, P.L. 1242, 36 P.S. Highway and Bridges § 670-502](#), gives the Secretary of Transportation the power to determine the width, type, and location of any state highway it constructs or improves, and to determine the types of maintenance activities the Department will perform. The Department's policy in townships has been to limit maintenance responsibility for municipal storm and sanitary sewer systems to the greatest extent possible, maintaining systems necessary only to support the function of the highway.

**EXHIBIT 1**

The control of storm water within their jurisdictions has long been a function of local governments. Legal authority for the construction and maintenance of storm water drainage facilities, including highway storm water drainage facilities, has traditionally been separate from the legal authority that enables construction and maintenance of roads themselves. For example: (a) the Act of May 24, 1901, P.L. 294, and the Act of April 28, 1899, P.L. 104, both related to municipal construction of sewers and drains; (b) the [Act of June 13, 1836, P.L. 551](#), related to establishment and maintenance of drains and ditches necessary to carry water off roads; and (c) [53 P.S. §57401 et seq.](#), of the current First Class Township Code, and [53 P.S. §§67320 and 67701 et seq.](#), of the current Second Class Township Code relate to storm water facilities. Storm water is addressed in the [Municipalities Planning Code, 53 P.S. §10503](#), and is part of all municipal planning and private land development approvals. In addition, the [Storm Water Management Act, 32 P.S. §680.1 et seq.](#), was enacted in response to the impacts of accelerated storm water runoff resulting from land development in the state. It requires counties to prepare and adopt watershed-based storm water management plans and requires local governments to adopt and implement ordinances to regulate development consistent with these plans.

In 2007, the Pennsylvania State [Transportation Advisory Committee \(TAC\)](#), consisting of members from the legislature, the public and state agencies, studied and issued a report entitled Storm Water Facilities on State Highways. The [TAC report](#) recognized that the management of storm water on state highways is a complex issue. Legally, cities and boroughs have the responsibility for maintenance of storm water facilities along State highways, and Department policy requires townships to maintain storm water systems as well. It also recognized that the Department's policies for the maintenance of state highways have their roots in the [State Highway Law of 1945](#), which is the basis of the Department's curb-to-curb maintenance policy.

The [TAC report](#) recommended that the General Assembly enact legislation to enable the establishment of special purpose municipal authorities to allow for the collection of appropriate fees to adequately maintain storm water facilities along State highways. Key attributes such as ease of fee collection, maintenance and administrative capabilities and other factors should be considered in establishing such entities. Legislation furthering the recommendations of the [TAC report](#) has not been introduced to date.

The Department's drainage maintenance policy is reflected in [Appendix B to Chapter 7](#) of this manual, page 5 through 7 of the findings in the [TAC report](#), and the Department's Drainage Manual. The 2011 modifications to Section 8.5 of this manual are not intended to alter the Department's legal interpretations as reflected in these documents or the Department's policies relating to municipalities other than townships. The 2011 modifications were implemented only to alter the types of maintenance activities the Department will perform in townships.

The assumption of responsibility for the structural condition of most enclosed facilities in townships does not alter the requirement that local governments must be the applicant for and responsible for the maintenance of enclosed surface drainage facilities under Highway Occupancy Permits issued pursuant to the [State Highway Law](#) and PennDOT [Publication 282](#). This is required in view of [Section 421 of the Act of Jun 1, 1945, P.L. 1242, State Highway Law, 36 P.S. Highway and Bridges §670-421](#), and the local government can address responsibility with the abutting landowner as part of the land development process. A model agreement between a local government and property owner for maintenance responsibilities in relation to facilities within State highway right-of-way is located on PennDOT's website.



**EXHIBIT 2****Sources of Curb-to-Curb Maintenance Policy**Policy

PennDOT's curb-to-curb maintenance policy can be found in [Circular Letters E-2211](#) and [RM 93-04](#), Section 8.5 of this manual, and [Appendix B to Maintenance Manual Chapter 7](#).

Cities – First and Second Classes

[Section 542 of the Act of Jun 1, 1945, P.L. 1242, 36 P.S. Highway and Bridges § 670-542](#), provides that PennDOT's maintenance responsibility does not include "the curbing and footways" of any adopted state highway. The City of Philadelphia was found to be responsible for a sidewalk in the city along a state highway in *White v. City of Philadelphia* 712 A.2d 345 (Pa. Cmwlth. 1998).

Cities – Second Class A and Third Class

[Section 522 of of the Act of Jun 1, 1945, P.L. 1242, 36 P.S. Highway and Bridges § 670-522](#), provides that PennDOT's maintenance responsibility is limited to the "curblines as established at the time of the passage of the act by which the street was designated a state highway" or where the Secretary of Transportation otherwise designates the curblines. PennDOT's curb-to-curb maintenance policy was upheld as in conformance with this section in *Wallace v. PennDOT*, 701 A.2d 307 (Pa. Cmwlth. 1997).

Boroughs and Incorporated Towns

[Section 513 of the Act of Jun 1, 1945, P.L. 1242, 36 P.S. Highway and Bridges § 670-513](#), gives the Secretary of Transportation the power to determine the width and type of maintenance activities PennDOT will perform. PennDOT's curb-to-curb maintenance policy was upheld as in conformance with this section in *O'Brien v. Borough of Jeannette*, 128 Pa. Super. 443, 194 A. 314 (1937).

Townships

PennDOT's policies on maintenance vary based upon the type of local government. These variations are based upon the [State Highway Law of 1945](#) and in some cases have been confirmed by appellate court decisions. [Section 502 of the Act of Jun 1, 1945, P.L. 1242, 36 P.S. Highway and Bridges §670-502](#), gives the Secretary of Transportation power to determine the width, type, and location of any state highway PennDOT constructs or improves, and to determine the types of maintenance activities PennDOT will perform. There is no reported case law in Pennsylvania reviewing PennDOT's policy in townships, which does allow for maintenance beyond curblines in certain circumstances.

**EXHIBIT 3**

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF TRANSPORTATION

IN REPLY REFER TO

\_\_\_\_\_ County

S.R. \_\_\_\_\_, Seg. \_\_\_\_\_, Offset \_\_\_\_\_

\_\_\_\_\_ Township/Borough Blocked Drainage

TO: \_\_\_\_\_

Dear \_\_\_\_\_:

The Department of Transportation has been experiencing drainage problems at the above referenced location. Our drainage facility at this site is blocked and must be cleaned and reopened.

It is apparent that recent earthwork on your property altered the existing drainage facilities and drainage courses in this area.

The blockage of any highway drainage facility is a violation of the [Pennsylvania State Highway Law, Act of Jun 1, 1945, P.L. 1242, Section 417](#). Therefore, please be advised that you are hereby ordered to reopen the above referenced highway storm water facility on or before \_\_\_\_\_. Failure to do so will subject you to legal action under the above referenced section of the highway law.

The drainage facility in question is a legal Commonwealth drainage easement and is shown on sheet \_\_\_\_ of the plans for the above referenced route. These plans were signed by Governor \_\_\_\_\_ on \_\_\_\_ [Date] and recorded in \_\_\_\_\_ County Book, \_\_\_\_\_, pages \_\_\_\_\_ to \_\_\_\_\_. The road in question is legally described in \_\_\_\_\_ County Road Docket \_\_\_\_\_, Page(s) \_\_\_\_\_, \_\_\_\_\_. The road became a state highway by Act of the Legislature, Public Law \_\_\_\_\_, \_\_\_\_\_ [date].

A copy of this plan is available for your review at our \_\_\_\_\_ County Office, between the hours of \_\_\_\_\_ to \_\_\_\_\_.

*[NOTE: If the plans are old they may not have been recorded in the local court house. If this is the case, omit this paragraph.]*

Should you have any questions concerning this matter, please contact me at \_\_\_\_\_.

Very truly yours,

\_\_\_\_\_

cc: Chief, Maintenance Technical Leadership Division

*[NOTE: Send certified mail, return receipt requested.]*

**EXHIBIT 4**

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF TRANSPORTATION

IN REPLY REFER TO

\_\_\_\_\_ County

S.R. \_\_\_\_\_, Seg. \_\_\_\_\_, Offset \_\_\_\_\_

\_\_\_\_\_ Township/Borough Blocked Drainage

TO: \_\_\_\_\_

Dear \_\_\_\_\_:

The Department of Transportation has been experiencing drainage problems at the above referenced location. Our drainage facility at this site is blocked and must be cleaned. When the drainage facility is reopened, the water will enter upon your property. The drainage facility in question is a legal Commonwealth drainage easement and is shown on sheet \_\_\_\_\_ of the plans for the above referenced route. These plans were signed by Governor \_\_\_\_\_ on \_\_\_\_ [Date] \_\_\_\_ and recorded in \_\_\_\_\_ County Book, \_\_\_\_\_, pages \_\_\_\_\_ to \_\_\_\_\_. A copy of this plan is available for your review at our \_\_\_\_\_ County Office, between the hours of \_\_\_\_\_ to \_\_\_\_\_.

*[NOTE: If the plans are old they may not have been recorded in the local courthouse. If this is the case, omit the last sentence.]*

Please be advised that on \_\_\_\_\_, the Commonwealth of Pennsylvania Department of Transportation will enter your property at the above referenced location solely for the purpose of reestablishing drainage.

Our authority to enter your property to reestablish drainage is contained in the [State Highway Law, Act of Jun 1, 1945, P.L. 1242, Section 417](#), which states in part: "The Department shall have authority to enter upon any lands or enclosures and cut, open, maintain, and repair such drains or ditches, inlets, or outlets through the same as are necessary to carry the waters from roads, highways, or within, at the top, or base of, slope areas, constructed or improved at the expense of the Commonwealth or under its supervision."

Should you have any questions concerning this matter, please contact me at \_\_\_\_\_.

Very truly yours,

\_\_\_\_\_

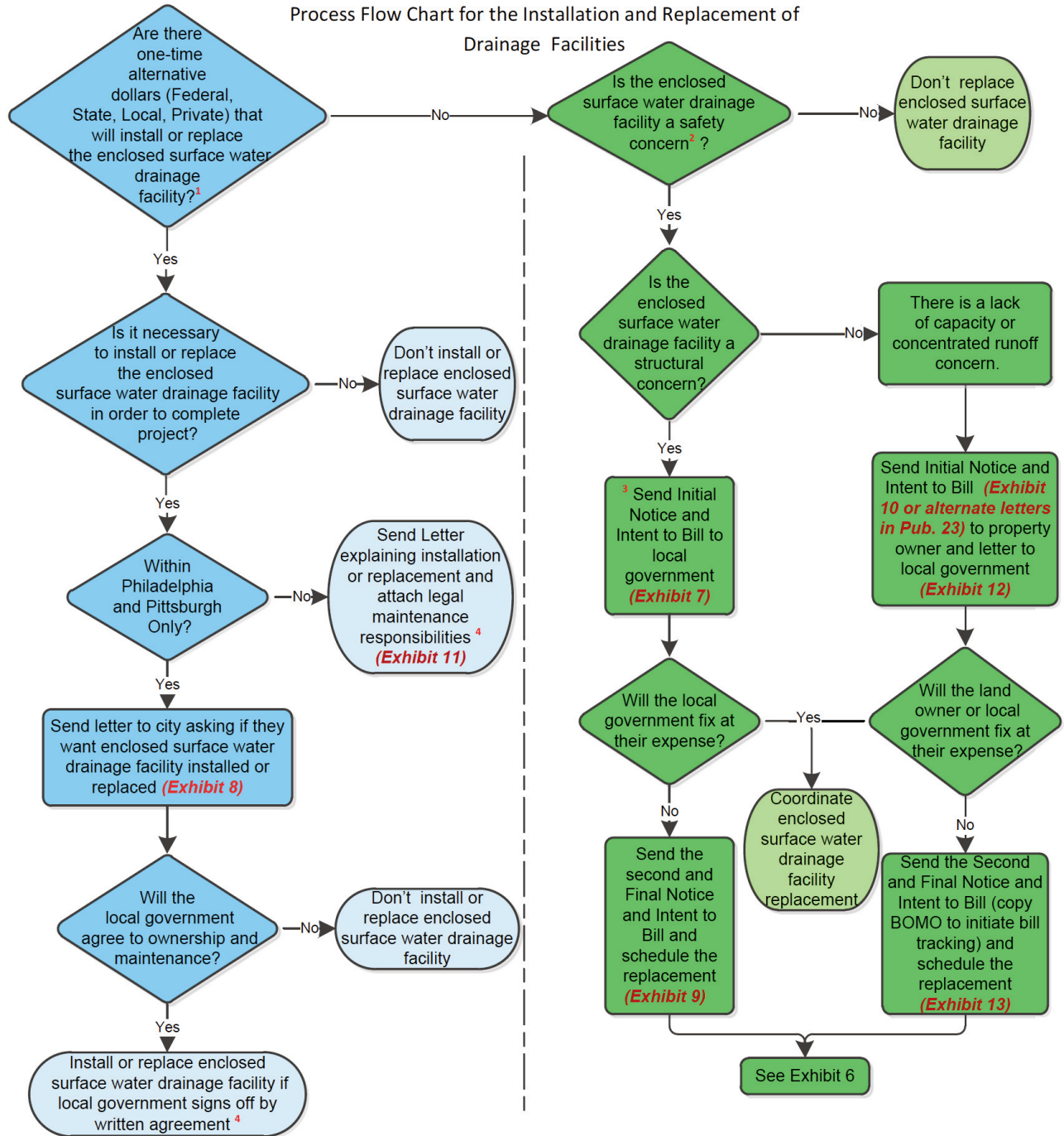
cc: Chief, Maintenance Technical Leadership Divison

*[NOTE: Send certified mail, return receipt requested.]*

### EXHIBIT 5A

**Note: Under most scenarios, it is appropriate to meet with the municipality before sending a letter**

Exhibit 5A – Cities / Boroughs/Property Owners  
Process Flow Chart for the Installation and Replacement of  
Drainage Facilities



**Notes:**

1 The District Executive, within early planning stages, has the authority to request local cost sharing

2 A safety concern is noted as a pavement surface condition requiring immediate attention

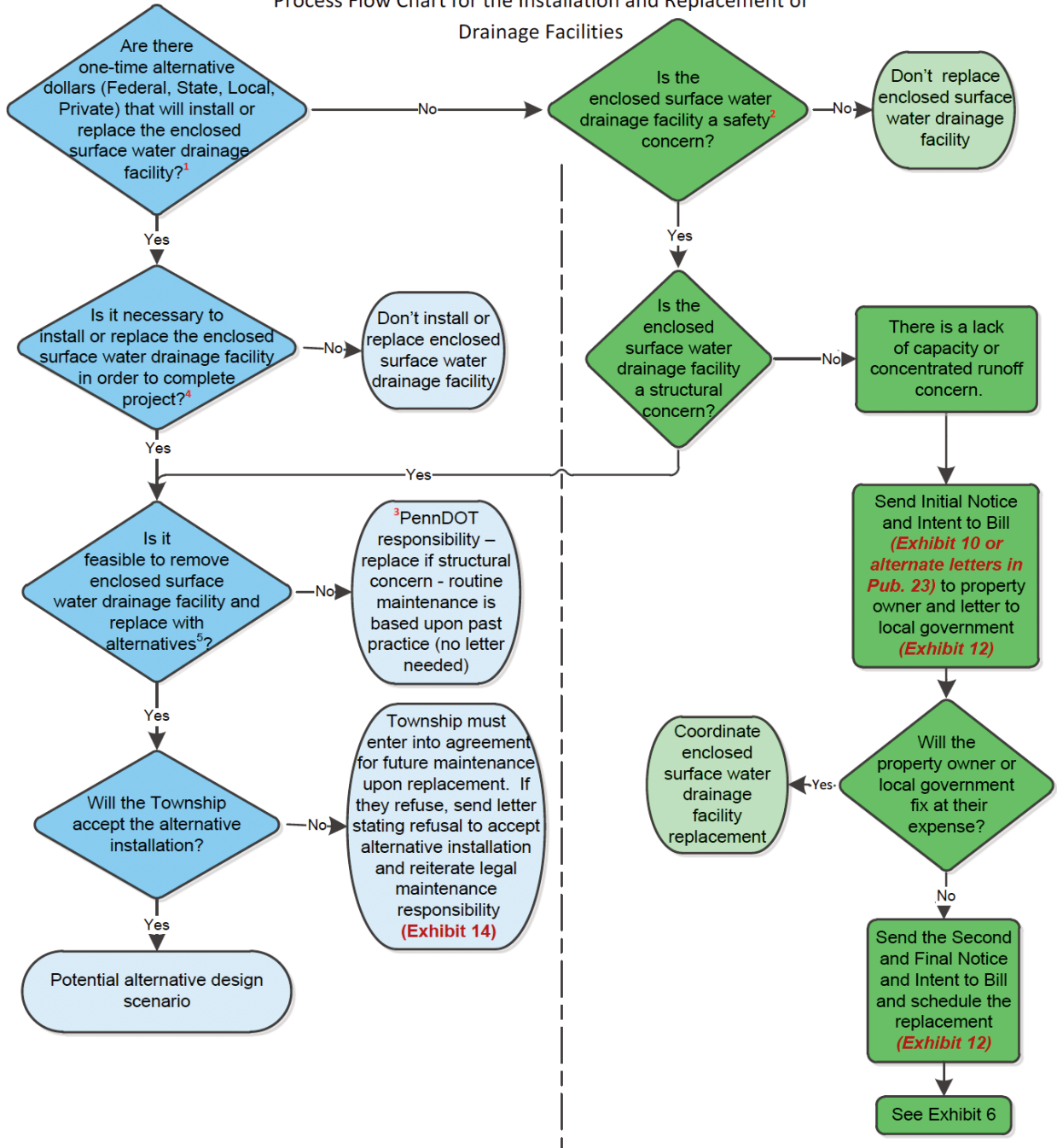
3 If a safety concern is an emergency and within travel lanes, erect traffic control devices, reroute traffic, and replace

4 If a project includes a storm water basin, District Environmental Manager updates state-wide database

**EXHIBIT 5B**

**Note: Under most scenarios, it is appropriate to meet with the municipality before sending a letter**

Exhibit 5B – Townships/Property Owners  
Process Flow Chart for the Installation and Replacement of  
Drainage Facilities



**Notes:**

Planned Projects / Design	Unplanned Projects / Maintenance
---------------------------	----------------------------------

1 The District Executive, within early planning stages, has the authority to request local cost sharing  
 2 A safety concern is noted as a pavement surface condition requiring immediate attention  
 3 If safety concern is an emergency and within travel lanes, erect traffic control devices, reroute traffic, and replace  
 4 If a project includes a storm water basin, District Environmental Manager updates state-wide database  
 5 Alternative installations include grass swales, infiltration trench, etc.



### EXHIBIT 6

#### SURFACE WATER DRAINAGE FACILITY BILLING PROCESS

**INPUT:**

- Phone call from property owner
- Phone call via 1-800-FIX-ROAD
- Discovered via routing maintenance trips
- Press office receives notification  
**(Note: By issuance of the policy the WBS charge code will get entered into the Foreman's Manual)**

**1**  
District/County  
Maintenance Unit

1. Receives input
2. Notifies District Office

Call/  
Email

**2**  
District Office

1. Receives call/email
2. Performs field investigation
3. Determines responsible party for repairs
4. Meets with responsible party to discuss findings
5. Sends meeting follow up letter to responsible party (DE does this)
6. Follows up with notification provider

Letter

**3**  
Responsible Party

1. Receives letter
2. Responds to letter in writing (typically within 30 days)  
**(Note: The person in the DO who sent the letter tracks the response time)**  
**(Note: The response can either agree or disagree with findings. If agrees, County Office monitors repairs)**

Disagree Letter or exceeds required response time

**4**  
District Office DE

1. Receives letter or exceeds required response time
2. Sends second letter to responsible party indicating PennDOT will complete repairs and bill responsible party  
**(Note: BOMO, BFM and County receive copy of letter)**  
**(Note: District Maint. Mgr. notifies Assist. County Maint. Mgr. to schedule repairs)**

Call/  
Email

**5**  
Assistant County  
Maintenance Mgr.\*

1. Receives call/email
2. Determines costs for repairs
3. Set up SAP Plan Maintenance work order. See Section 8.6 for charge code.
4. Notifies DOFO via email costs to bill responsible party

Email

**6**  
District Office  
Fiscal Officer

1. Receives email
2. Completes FB 70 indicating SAP code from BFM
3. Completes invoice containing detail information including payment should be sent to Comptroller
4. Generates invoice
5. Mails invoice to responsible party for payment, starts 45-day dunning.  
**[Note: BOMO, (Chief, MTL) receives copy of invoice]**

Invoice

**7**  
Responsible Party

1. Receives invoice
2. Sends payment to Comptroller

Payment

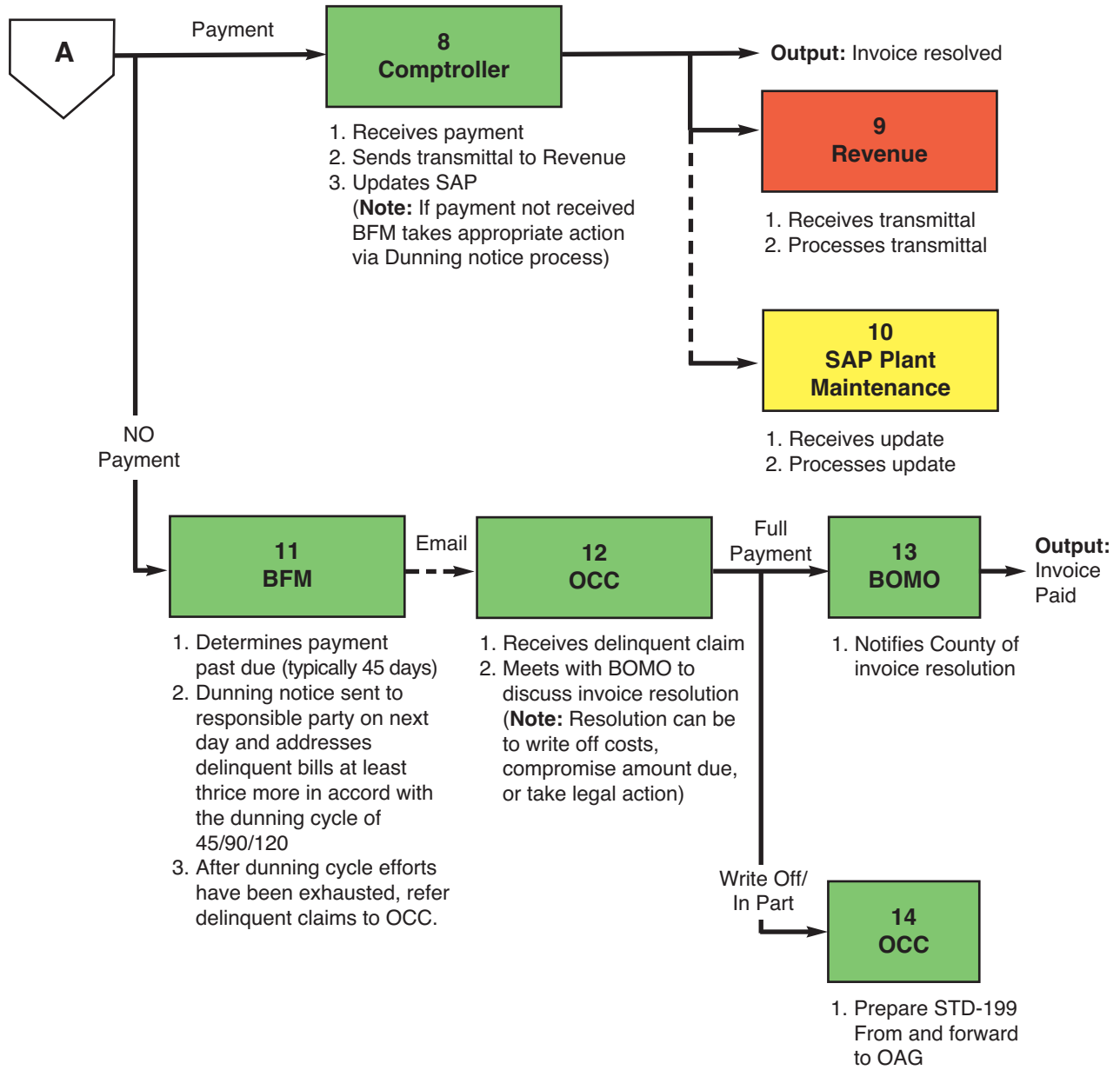


\* Work completed during this phase.

<b>BOMO Storm Water</b>	
Top Down Map	Page-1 of 3
Last Update: Thursday, August 29, 2013	

**EXHIBIT 6**

**SURFACE WATER DRAINAGE FACILITY BILLING PROCESS**



**NOTE:** As part of the Quality Assurance process BOMO will create a Business Warehouse Report for monitoring purposes

**KEY:**  
 BFM - Bureau of Fiscal management  
 BOMO - Bureau of Maintenance and Operations  
 DE - District Executive  
 DOFO - District Office Fiscal officer  
 OCC - Office of Chief Counsel  
 WBS - Work Breakdown Structure  
 OAG - Office of the Attorney General

## EXHIBIT 6

### SURFACE WATER DRAINAGE FACILITY BILLING PROCESS

#### MAP KEY



A function within the control of the Department of Transportation



A function outside the control of the Department of Transportation



Electronic processing or input into an electronic system



Electronic notification i.e. email

**Hand-off Text**

The item transferred between functional groups. Hand-offs may take several forms as they move through the process

**Key Control Point Text**

An action critical to the completion of the process. An action that determines if the process continues

**Note: The Unit Manager or Counselor must enter tentative approval date into IRSS within 3 days of approval**

A time reference; a task that must be completed within a certain time period

<b>BOMO Storm Water</b>	
<b>Top Down Map</b>	<b>Page 3 of 3</b>
Last Updated: Monday, September 06, 2011	

**EXHIBIT 7**

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF TRANSPORTATION

IN REPLY REFER TO

\_\_\_\_\_ County

S.R. \_\_\_\_\_, Seg. \_\_\_\_\_, Offset \_\_\_\_\_

\_\_\_\_\_ Borough/City

Pavement Surface Condition Repair

TO: \_\_\_\_\_

Dear \_\_\_\_\_:

The Department of Transportation has identified a pavement surface condition caused by your drainage facility at \_\_\_\_\_[LOCATION]\_\_\_\_\_. This condition presents a safety concern to the motoring public. Although the facility is located within State right-of-way, maintenance is your responsibility in accordance with the [State Highway Law](#).

We therefore request that you repair the enclosed surface water drainage water facility by \_\_\_ [DATE]\_\_\_\_. If you refuse, the Department may schedule the repairs and bill you for cost.

Please respond in writing with your intent by \_\_\_ [DATE]\_\_\_\_, and contact the District Permit Manager at \_\_\_\_\_ for any needed permits. We have also attached copies of the referenced [State Highway Law](#). Should you have any questions concerning this matter, please contact the District Permit Manager.

Very truly yours,

\_\_\_\_\_

cc: Chief, Maintenance Technical Leadership Division

[Optional: Send certified mail, return receipt requested.]

Attachments [attach Exhibits 1 and 2]

**EXHIBIT 8**

**NOTE: CITY OF PHILADELPHIA AND PITTSBURGH ONLY**  
COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF TRANSPORTATION

IN REPLY REFER TO

\_\_\_\_\_ County

S.R. \_\_\_\_\_, Seg. \_\_\_\_\_, Offset \_\_\_\_\_

\_\_\_\_\_ City

Enclosed Surface Water Drainage Facility Repair

TO: \_\_\_\_\_

Dear \_\_\_\_\_:

The Department of Transportation is developing designs for \_\_\_\_\_ [PROJECT] \_\_\_\_\_ and is willing to replace the enclosed surface water drainage facility at \_\_\_\_\_ [LOCATION] \_\_\_\_\_. Since funding is available and allowable for pipe design and construction, the Department is prepared to replace the facility at no cost to \_\_\_\_\_ [CITY] \_\_\_\_\_. Although this is a Department project and within State right-of-way, the future maintenance is the City’s responsibility in accordance with the [State Highway Law](#). You must respond via written communication by \_\_\_ [DATE]\_\_\_ accepting future maintenance of the enclosed surface water drainage facility in order for the Department to replace the enclosed surface water drainage facility as part of this project. Should you choose not to respond or do not accept future maintenance responsibility, the enclosed surface water drainage facility will not be replaced, and the Department will reallocate funding accordingly

Please see the attached documents outlining the maintenance responsibilities found within the [State Highway Law](#). Should you have any questions concerning this matter, please contact the District Permit Manager at \_\_\_\_\_.

Very truly yours,

\_\_\_\_\_

cc: Chief, Maintenance Technical Leadership Divison  
[Optional: Send certified mail, return receipt requested.]  
Attachments [attach Exhibits 1 and 2]



**EXHIBIT 9**

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF TRANSPORTATION

IN REPLY REFER TO

\_\_\_\_\_ County

S.R. \_\_\_\_\_, Seg. \_\_\_\_\_, Offset \_\_\_\_\_

\_\_\_\_\_ Borough/City

Pavement Surface Condition Repair

SECOND AND FINAL NOTICE

TO: \_\_\_\_\_

Dear \_\_\_\_\_:

Our letter dated \_\_\_\_ [DATE] \_\_\_\_ notified you that the pavement surface condition caused by your drainage facility at \_\_\_\_ [LOCATION] \_\_\_\_ is a safety concern due to its condition. In that referenced letter, we requested that \_\_\_\_ [MUNICIPALITY] \_\_\_\_ repair it. Maintenance is your responsibility under the [State Highway Law](#) even though the facility is located within State right-of-way. To date, you have not made the needed repairs.

We have therefore elected to make the repairs and bill you for the cost in order to protect the integrity of the highway and preserve public safety. [PICK ONE STATEMENT: "This project has been contracted and \_\_\_\_ [MUNICIPALITY] \_\_\_\_ is responsible for the total contract cost." OR "This project will be completed by Department forces and will be billed to \_\_\_\_ [MUNICIPALITY] \_\_\_\_ based on actual cost."] Repairs are schedule to begin on \_\_\_\_ [DATE] \_\_\_\_.

Should you have any questions concerning this matter, please contact the District Permit Manager at \_\_\_\_\_.

Very truly yours,

\_\_\_\_\_

cc: Chief, Maintenance Technical Leadership Divison  
[Optional: Send certified mail, return receipt requested.]

**EXHIBIT 10**COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF TRANSPORTATION

IN REPLY REFER TO

\_\_\_\_\_ County

S.R. \_\_\_\_\_, Seg. \_\_\_\_\_, Offset \_\_\_\_\_

\_\_\_\_\_ Township

Concentrated Storm Water Runoff Problems

TO: \_\_\_\_\_

Dear \_\_\_\_\_:

The Department of Transportation has identified serious drainage problems at the above-referenced location requiring your immediate action. We have determined that resulting concentrated runoff directed onto the State right-of-way causes flooding during rain events, which in turn creates a potentially unsafe condition for the traveling public.

It is apparent that earthwork on your property altered the existing drainage facilities and water courses in this area. (If applicable: The earthwork creates a hazard to public safety as confirmed by the Department records, including crash summary history revealing that [NUMBER] reportable crashes occurred in the area during snow or wet conditions.) Directing runoff other than sheet flow onto a State highway without first obtaining a permit is a violation of the [Pennsylvania State Highway Law, Act of Jun 1, 1945, P.L. Sections 417, 420 and 421](#), and Department regulations found at [67 PA Code Chapter 441](#). Specifically, you may not alter the flow of water to or from a State highway without authority of the Department under a Highway Occupancy Permit (HOP), and it is unlawful to direct the discharge of drainage onto or within the legal limits of a State highway.

Therefore, you must remedy the above referenced violation on or before \_\_\_\_ [DATE] \_\_\_\_ as stated in the attached citation. A HOP issued by the Department is required to conduct the required work within the legal limits of the State highway.

Failure to inform \_\_\_\_\_ [MAINTENANCE CONTACT] \_\_\_\_\_, of your plan within 30 days and apply for and obtain a HOP if work is required within the right-of-way may subject you to legal action.

Moreover, on or after \_\_\_\_ [DATE] \_\_\_\_ if you have not obtained a HOP to remedy this situation, the Department may elect to perform the minimum essential work in the State highway and on your property to abate and remedy the situation at your sole cost and expense. You will be invoiced for all the Department's costs, expenses and overhead.

Very truly yours,

\_\_\_\_\_

cc: [LOCAL GOVERNMENT]

Chief, Maintenance Technical Leadership Division

[Optional: Send certified mail, return receipt requested.]

**EXHIBIT 11**

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF TRANSPORTATION

IN REPLY REFER TO

\_\_\_\_\_ County

S.R. \_\_\_\_\_, Seg. \_\_\_\_\_, Offset \_\_\_\_\_

\_\_\_\_\_ Borough/City

Enclosed Surface Water Drainage Facility Replacement

TO: \_\_\_\_\_

Dear \_\_\_\_\_:

The Department of Transportation is preparing plans for \_\_\_\_\_ [PROJECT]\_\_\_\_\_ and will be replacing the enclosed surface water drainage facilities along \_\_\_\_\_ [LOCATION]\_\_\_\_\_. Funding for this project utilizes appropriated funding for design and construction - no money will be available for future maintenance of these facilities. Although this is a Department project and within State right-of-way, the future maintenance is the responsibility of the local government in accordance with the [State Highway Law](#).

For your reference, please see the attached documents outlining the maintenance responsibilities found within the [State Highway Law](#). These responsibilities can also be confirmed within the [2007 Transportation Advisory Committee Report](#) on Storm Water Facilities on State Highways. Should you have any questions concerning this project, please contact the District Permit Manager at \_\_\_\_\_.

Very truly yours,

\_\_\_\_\_

cc: Chief, Maintenance Technical Leadership Division  
[Optional: Send certified mail, return receipt requested.]  
Attachments [attach Exhibits 1 and 2]

**EXHIBIT 12**

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF TRANSPORTATION

IN REPLY REFER TO

\_\_\_\_\_ County

S.R. \_\_\_\_\_, Seg. \_\_\_\_\_, Offset \_\_\_\_\_

\_\_\_\_\_ Township/City/Borough

Concentrated Storm Water Runoff Problems

TO: \_\_\_\_\_

Dear \_\_\_\_\_:

This letter is to inform you of concentrated storm water runoff problems at the above location. The Department has informed the property owner, \_\_\_\_\_[PROPERTY OWNER]\_\_\_\_\_, of the issue. It is apparent that earthwork on the property altered the existing drainage facilities and water courses in this area. The direction of runoff other than sheet flow onto a State highway is a violation of the [State Highway Law, Act of Jun 1, 1945, P.L. 1242, Sections 417, 420 and 421](#), and Department regulations found at [67 PA. Code Chapter 441](#). Specifically, a property owner may not alter the flow of water to or from a State highway without authority of the Department under a Highway Occupancy Permit (HOP), and it is unlawful to direct the discharge of drainage onto or within the legal limits of a State highway.

The property owner has been directed to correct the problem before \_\_\_\_[DATE]\_\_\_\_ through the Department’s HOP process. Should you have any questions concerning this matter, please contact the District Permit Manager at \_\_\_\_\_.

Very truly yours,

\_\_\_\_\_

cc: Chief, Maintenance Technical Leadership Division  
[Optional: Send certified mail, return receipt requested.]

**EXHIBIT 13**

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF TRANSPORTATION

IN REPLY REFER TO

\_\_\_\_\_ County

S.R. \_\_\_\_\_, Seg. \_\_\_\_\_, Offset \_\_\_\_\_

\_\_\_\_\_ Township/Borough/City

Concentrated Storm Water Runoff Problems

SECOND AND FINAL NOTICE

TO: \_\_\_\_\_

Dear \_\_\_\_\_:

Per our letter dated \_\_\_\_ [DATE] \_\_\_\_, the Department of Transportation has notified you of a pavement surface condition at \_\_\_\_\_ [LOCATION] \_\_\_\_\_ as a safety concern due to its condition. It is apparent that earthwork on your property altered the existing drainage facilities and courses in this area. The Department on [DATE] requested you remedy the situation and since you have not acted upon this request, the Department will perform the essential work in the State Highway Right-of-Way and on your property and you will be billed based on actual cost. Repairs are scheduled to begin on \_\_\_\_ [DATE] \_\_\_\_.

Should you have any questions concerning this matter, please contact the District Permit Manager at \_\_\_\_\_.

Very truly yours,

\_\_\_\_\_

cc: [LOCAL GOVERNMENT]  
Chief, Maintenance Technical Leadership Division  
[Optional: Send certified mail, return receipt requested.]



**EXHIBIT 14**

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF TRANSPORTATION

IN REPLY REFER TO

\_\_\_\_\_ County

S.R. \_\_\_\_\_, Seg. \_\_\_\_\_, Offset \_\_\_\_\_

\_\_\_\_\_ Township

Future Maintenance Responsibilities of Enclosed Surface Drainage Facility

TO: \_\_\_\_\_

Dear \_\_\_\_\_:

Through previous correspondence, PennDOT has expressed interest in removing the enclosed surface water drainage facility at \_\_\_\_\_[LOCATION]\_\_\_\_\_ and replacing it with an alternative installation to eliminate maintenance responsibilities. This letter is to inform you of your maintenance responsibilities of the enclosed surface water drainage facility since you preferred to have these facilities installed rather than utilize alternative installations. Although the facility is within State right-of-way, the maintenance is the Township’s responsibility in accordance with the [State Highway Law](#).

Should you have any questions concerning this matter, please contact me at \_\_\_\_\_.

Very truly yours,

\_\_\_\_\_

cc: Chief, Maintenance Technical Leadership Division

[Optional: Send certified mail, return receipt requested.]

Attachments [attach Exhibits 1 and 2]

**EXHIBIT 15**

M-12 (12-19)



**ILLICIT DISCHARGE REPORTING FORM**

**Inspector Information**

Name: _____	
Contact Phone Number: _____	Date and Time Discharge Discovered: _____

**Discharge Information**

PID Identification Number: _____			
COUNTY	SR	SEGMENT	OFFSET
(1) Owner Name/Address: _____			
City/Boro/Twp: _____		Nearest Intersection/Landmark: _____	
GPS location, if known: _____		Lat: _____	Long: _____

How Long since Last Rainfall: <input type="checkbox"/> Raining Now <input type="checkbox"/> 0-2 Days <input type="checkbox"/> 3 or more Days	Nature of Discharge or Flow: <input type="checkbox"/> Solid (Continuous) <input type="checkbox"/> Intermittent (Occasional) <input type="checkbox"/> Pulsing (Fluctuating) <input type="checkbox"/> Transitory (Prior Spill)
If possible, identify the source of the discharge* <input type="checkbox"/> Pipe Outfall <input type="checkbox"/> Gutter <input type="checkbox"/> Sanitary Wastewater <input type="checkbox"/> Ditch <input type="checkbox"/> Septic System <input type="checkbox"/> Spill <input type="checkbox"/> Storm Sewer <input type="checkbox"/> Other: _____	Potential for Discharge to enter into: <input type="checkbox"/> Stream/Water Body <input type="checkbox"/> Wetland <input type="checkbox"/> Storm Drain <input type="checkbox"/> Other: _____
* Add descriptions of discharge/source to Field Photograph Log Sheet	
Was water flow observed? <input type="checkbox"/> Yes <input type="checkbox"/> No Direct Connection to pipe/inlet? <input type="checkbox"/> Yes <input type="checkbox"/> No	Was a photo taken? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, attach photos.

(2) Describe Odor:

<input type="checkbox"/> None	<input type="checkbox"/> Musty	<input type="checkbox"/> Rotten Eggs (Sulphur)	<input type="checkbox"/> Rancid/Sour Milk
<input type="checkbox"/> Sewage	<input type="checkbox"/> Gas/Petroleum	<input type="checkbox"/> Cooking Oil	<input type="checkbox"/> Other: _____

(2) Describe Clarity:

<input type="checkbox"/> Clear	<input type="checkbox"/> Cloudy	<input type="checkbox"/> Opaque	<input type="checkbox"/> Sheen	<input type="checkbox"/> Gray
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(2) Describe Color:

<input type="checkbox"/> Red	<input type="checkbox"/> Yellow	<input type="checkbox"/> Brown	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> White	<input type="checkbox"/> Other: _____
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(2) Solids/Floatables:

<input type="checkbox"/> Garbage	<input type="checkbox"/> Sewage	<input type="checkbox"/> Tissue	<input type="checkbox"/> Oil Sheen	<input type="checkbox"/> Suds	<input type="checkbox"/> Scum	<input type="checkbox"/> Iron Sheen	<input type="checkbox"/> Unknown
----------------------------------	---------------------------------	---------------------------------	------------------------------------	-------------------------------	-------------------------------	-------------------------------------	----------------------------------

Additional Information to assist in the Investigation (Vegetation Impacts?): \_\_\_\_\_  
 Describe Upstream/Source Origin/Land Use:  Forest  Ag  Res  Farmstd  Com  Ind  Vac  Inst  Muni  Mng

SEMP Mgr. Send completed form to: [RA-pdIDDE@pa.gov](mailto:RA-pdIDDE@pa.gov)

<i>Follow up Investigation (to be completed by District staff)</i>		
Outfall Location: _____	Within UA?: Y / N	County _____
<b>FIELD ANALYSIS:</b>		
Odor: _____	Solids/Floatables: _____	Flow: _____
Clarity: _____	Sheen/Scum: _____	Source Confirmed? Y / N
Color: _____	Condition of Vegetation: _____	Direct Connection? Y / N
Comments: (Immediate Environmental Concern? Y / N)		
DATE: _____	Inspection Name _____	Additional notes to file: _____
Follow-up with Complainant: _____	Send Confirmed ID Elimination/Removal Letter: _____	

**EXHIBIT 15****INSTRUCTIONS TO COMPLETE ILLICIT DISCHARGE (PID) REPORTING FORM****WHAT IS AN ILLICIT DISCHARGE:**

An illicit discharge is any discharge into the highway storm sewer system that is not composed entirely of stormwater. **Examples:**

- Dry weather discharges of wastewater into the storm sewer system from illegal dumping; spills and other non-stormwater pollution sources
- Discharges of pollutants, contaminants or illicit materials into storm drainage/sewer systems (oil, grease, solvents, metals, nutrients, toxics, viruses, bacteria)
- Improper antifreeze, oil disposal from vehicle maintenance, service stations
- Vehicle washing wastewaters
- Autobody/repair facility waste waters
- Plating shop waste water
- Manufacturers waste water
- Private service agencies waste water
- Wholesale/retail est. waste water
- Sanitary wastewater/connections
- Mobile rug cleaning waste dumping
- Laundry waste waters
- Disposal of auto/household toxics
- Vehicular/accidental spills
- Dairy barn waste waters
- On-lot disposal system- sewage effluent.

**WHAT IS NOT AN ILLICIT DISCHARGE:**

The following non-stormwater discharges are not illicit discharges:

- Discharges from firefighting activities
- Potable water sources including dechlorinated waterline and fire hydrant flushings
- Irrigation drainage
- Lawn watering
- Water from individual residential car washing
- Dechlorinated swimming pool discharges
- Water from crawl space pumps
- Uncontaminated water from foundation or footing drains
- Routine external building wash down which does not use detergents or other compounds
- Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless spilled material has been removed) and where detergents are not use
- Air conditioning condensate
- Springs
- Uncontaminated groundwater

**(1.) Property Owner Information:**

Determine property owners name, if available, and street address of the discharge source in the event that follow-up action or elimination is required. If unable to determine owner, write in "undetermined".

**(2.) Description of Discharge** for source identification/verification.

**a. Odor:** Determine which odors apply.

**b. Clarity:** How clear is the discharge?

**c. Color:** Discharge color and colors in swale, pipe, ditch, etc.(Document if red/green deficient)

**d. Solids/Floatables:** Identify indicators of source.

Description of Solids/Floatables: • Iron vs. Oil Sheens:

Iron leaches from soils forming a breakable sheen on stagnant water surfaces when poked with a stick. Oil sheens will conform around and coat the surface of the stick.

**EXHIBIT 16**COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF TRANSPORTATION

[Insert date]

**SENT REGULAR AND CERTIFIED MAIL**

[Insert Name and Address of Property Owner]

Re: Unlawful Discharge

Dear [Mr. and/or Ms. Property Owner]:

The Department has detected a discharge via an unauthorized connection to the State highway's drainage system. This discharge appears to be originating from your property onto property owned by the Commonwealth. **[Include a description of the location of the discharge and the characteristics of the discharge.]**

This discharge violates provisions of the [Pennsylvania Clean Streams Law](#) and the [U.S. Clean Water Act](#). The Department is requesting that you eliminate the unauthorized connection to the State highway's drainage system and the discharge immediately.

You have **thirty (30) days** from the date of this letter to remove the unauthorized connection to the State highway's drainage system and eliminate the discharge or to respond to this letter with a plan for the prompt removal of the connection and elimination of the discharge. If you fail to respond to this letter, refuse to eliminate the connection and discharge, or fail to promptly eliminate the connection and discharge, Department is obligated to refer this matter to the Pennsylvania Department of Environmental Protection (DEP) and other appropriate authorities for enforcement under the applicable environmental laws.

As PennDOT is required to maintain documentation, please respond in writing of your intentions to **[Insert address]**.

Sincerely,

District Executive

cc: [ADE Maintenance]  
[Central Office SEMP]  
[District SEMP Coordinator]

**EXHIBIT 17**

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF TRANSPORTATION

[Insert date]

**SENT REGULAR AND CERTIFIED MAIL**

[Insert Name and Address of Property Owner]

Re: Unlawful Discharge

Dear [Mr. and/or Ms. Property Owner]:

The Department has detected a discharge which appears to be originating from your property onto property owned by the Commonwealth. **[Include a description of the location of the discharge and the characteristics of the discharge.]**

This discharge violates provisions of the [Pennsylvania Clean Streams Law](#) and the [U.S. Clean Water Act](#). The Department is requesting that you eliminate the discharge immediately.

You have **thirty (30) days** from the date of this letter to eliminate the discharge or to respond to this letter with a plan for the prompt elimination of the discharge. If you fail to respond to this letter, refuse to eliminate the discharge, or fail to promptly eliminate the discharge, the Department is obligated to refer this matter to the Pennsylvania Department of Environmental Protection (DEP and other appropriate authorities for enforcement under the applicable environmental laws.

As PennDOT is required to maintain documentation, please respond in writing of your intentions to **[Insert address]**.

Sincerely,

District Executive

cc: [ADE Maintenance]  
[Central Office SEMP]  
[District SEMP Coordinator]

**EXHIBIT 18**

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF TRANSPORTATION

[Insert date]

**SENT REGULAR AND CERTIFIED MAIL**

**[Insert Name and Address of Property Owner]**

Re: Sump Pump Discharge

Dear **[Mr. and/or Ms. Property Owner]**:

PennDOT has been notified of a discharge which appears to be originating from your property at [LOCATION] onto property owned by the Commonwealth. Specifically, sump pump discharge spills onto [ROAD, COUNTY]. This discharge creates an unsafe condition to the highway.

This discharge violates provisions of the [Pennsylvania Clean Streams Law](#) and the [U.S. Clean Water Act](#). The Department is requesting that you eliminate the discharge immediately. [Section 421 of the Act of Jun 1, 1945, P.L. 1242, 36 P.S. Highway and Bridges § 670-421](#) indicates: "It is unlawful for any person to discharge sewage or drainage, except surface drainage, on, or within the legal limits of, any State highway."

You have **thirty (30) days** from the date of this letter to eliminate the discharge or to respond to this letter with a plan for the prompt elimination of the discharge. If you fail to respond to this letter, refuse to eliminate the discharge, or fail to promptly eliminate the discharge, the Department is obligated to refer this matter to the Pennsylvania Department of Environmental Protection (DEP and other appropriate authorities for enforcement under the applicable environmental laws and PennDOT may also elect to perform emergency repairs and bill you for that work including the placement of salt during periods of inclement weather.

As PennDOT is required to maintain documentation, please respond in writing of your intentions to **[Insert address]**.

Sincerely,

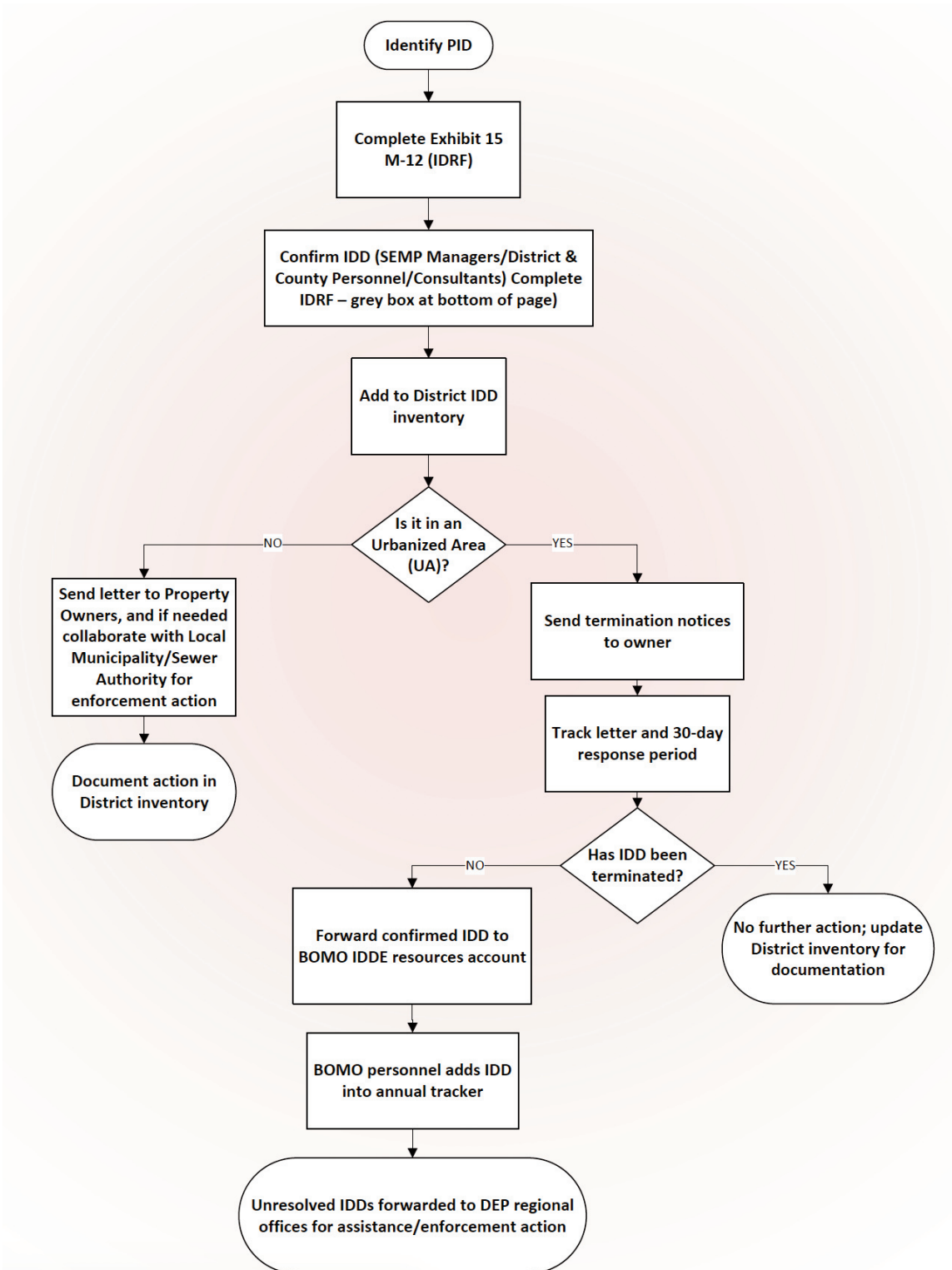
District Executive

cc: **[ADE Maintenance]**  
**[Central Office SEMP]**  
**[District SEMP Coordinator]**

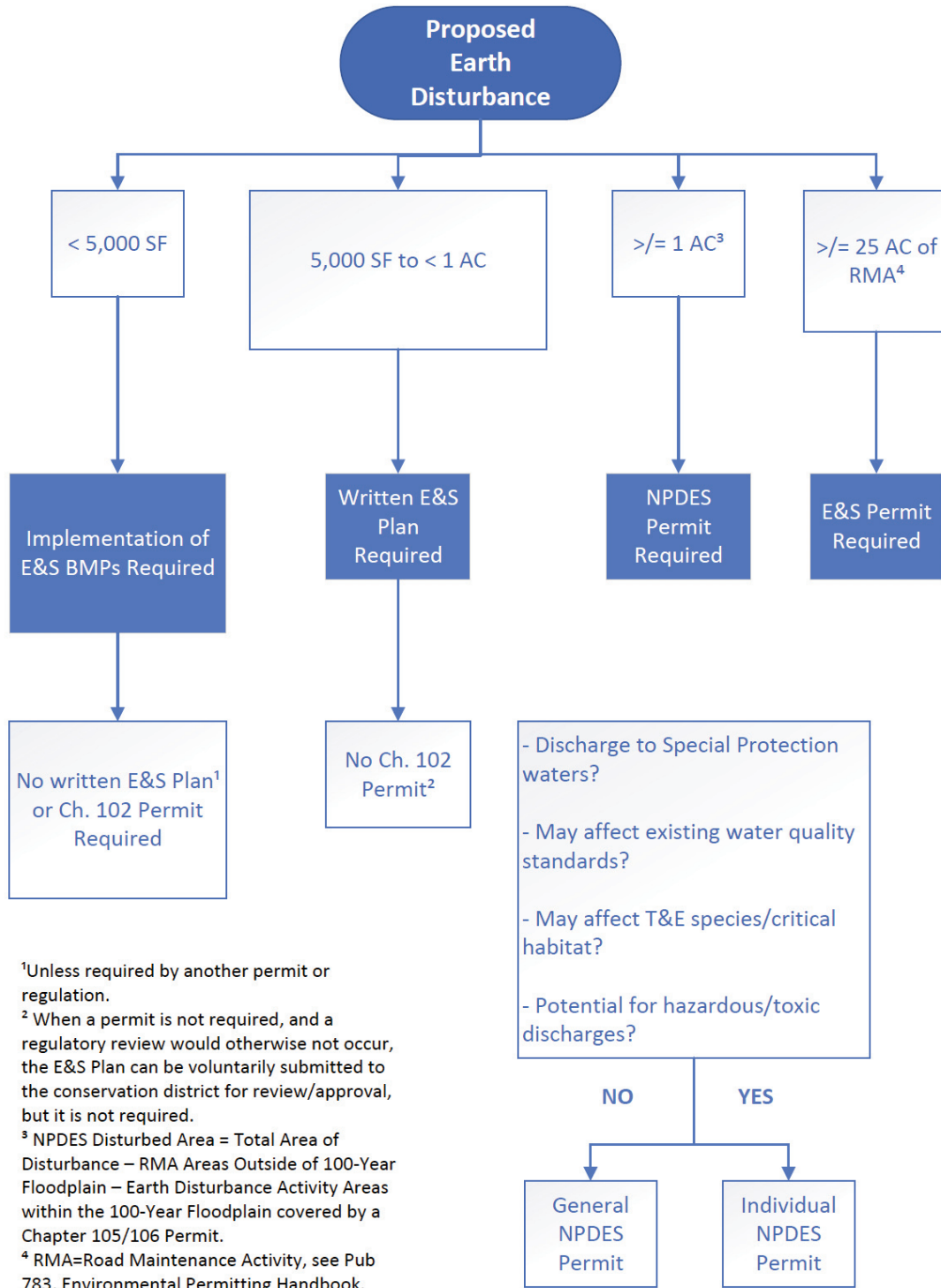


**EXHIBIT 19**

**PennDOT MS4 Potential Illicit Discharge  
Detection and Elimination Reporting Process**



**EXHIBIT 20**

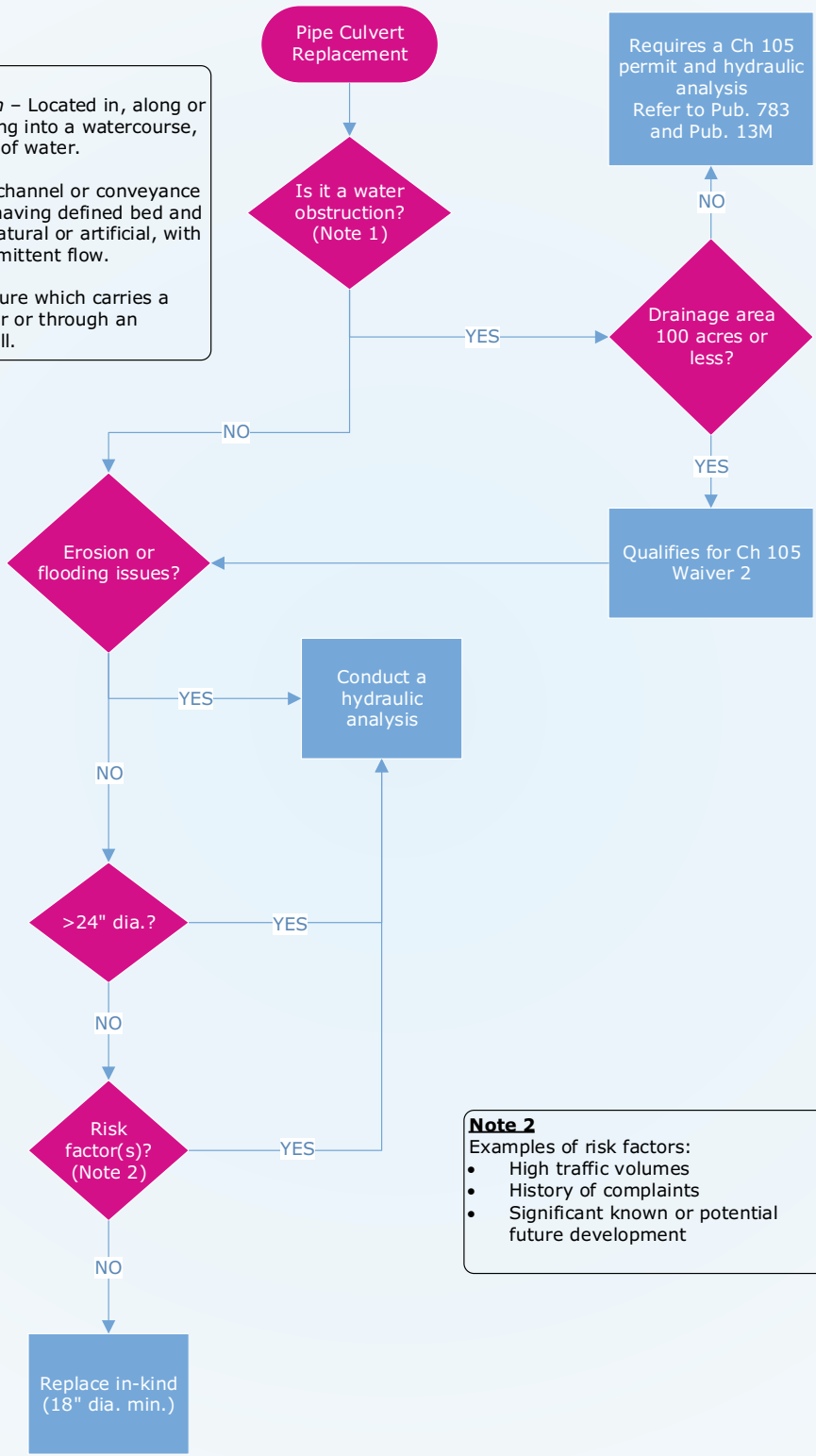


<sup>1</sup>Unless required by another permit or regulation.  
<sup>2</sup> When a permit is not required, and a regulatory review would otherwise not occur, the E&S Plan can be voluntarily submitted to the conservation district for review/approval, but it is not required.  
<sup>3</sup> NPDES Disturbed Area = Total Area of Disturbance – RMA Areas Outside of 100-Year Floodplain – Earth Disturbance Activity Areas within the 100-Year Floodplain covered by a Chapter 105/106 Permit.  
<sup>4</sup> RMA=Road Maintenance Activity, see Pub 783, Environmental Permitting Handbook.

**EXHIBIT 21**

**PIPE CULVERT REPLACEMENTS BY MAINTENANCE FORCES**

**Note 1**  
*Water Obstruction* – Located in, along or across or projecting into a watercourse, floodway or body of water.  
*Watercourse* – A channel or conveyance of surface water having defined bed and banks, whether natural or artificial, with perennial or intermittent flow.  
*Culvert* – A structure which carries a watercourse under or through an embankment or fill.



**Note 2**  
 Examples of risk factors:  
 • High traffic volumes  
 • History of complaints  
 • Significant known or potential future development